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# MOTOR AGE

Volume XXXV  
Number 6

PUBLISHED WEEKLY AT THE MALLERS BUILDING  
CHICAGO, FEBRUARY 6, 1919

Fifteen Cents a Copy  
Three Dollars a Year

## **Champion** Dependable Spark Plugs

### Wins Out in Government's Severe Shock Test

At the factory of the Chalmers Motor Car Company, of Detroit, Michigan, the United States Government was conducting a most exacting ignition test on the Holt-Caterpillar Tractors, used in war-work for hauling cannons, caissons, etc.

With motor at high speed under heavy load, the spark plugs at sizzling heat were doused with a bucketful of cold water.

This most severe test had not the slightest adverse effect, the opera-

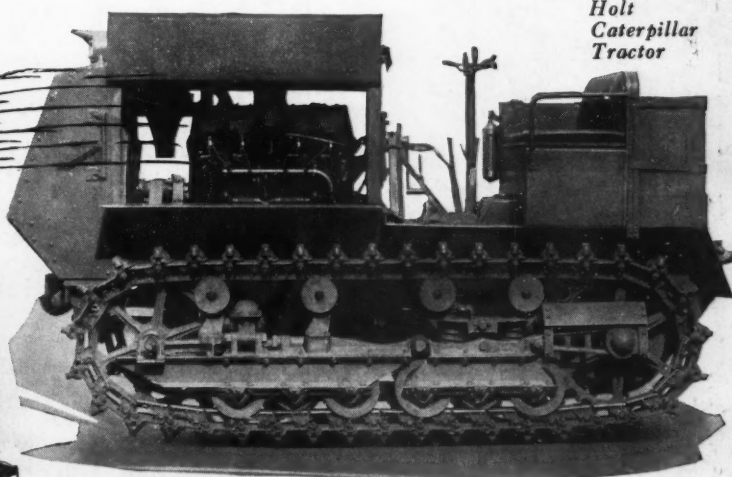
tion of the motor continued perfectly, not a spark plug "missed" even temporarily.

Every motor car owner has, in this test, irrefutable proof of the hardness and efficiency of Champion Spark Plugs.

Every Champion Spark Plug dealer has, in this test, additional proof of the wisdom of recommending the Champion Spark Plug especially designed for every type of motor.



JAS 43, 7/8-78. Price \$1.00  
Champion Heavy Duty



Holt  
Caterpillar  
Tractor

**Champion Spark Plug Company, Toledo, Ohio**  
Champion Spark Plug Co., of Canada, Limited, Windsor, Ontario



Mends  
Leaky  
Radiators



No  
Tools  
Required

## JOHNSON'S RADIATOR CEMENT

A NEW and efficient way of mending leaky radiators is with Johnson's Radiator Cement. It is quicker more economical and more satisfactory than any other method.

Flaxseed, meal, oat meal and bran which are used by many motorists, do not actually stop leaks they merely decrease them for a short time and these substances invariably stop up the regular water passages and are very difficult to clean out.

Johnson's Radiator Cement does not clog the tubes, it finds every leak no matter what part of the radiator or connections it is in, seals it up strong from the inside making it absolutely water tight. It does not injure the radiator, connections or rubber in any way.

If you allow the radiator to leak, trouble is sure to follow. Besides with a leaky radiator it is impossible to get proper circulation of water through the cooling system, thereby causing an overheated engine, scored cylinders and numerous other troubles.

### *Easy To Apply*

Johnson's Radiator Cement comes in liquid form and is very easy to use. First drain the radiator, mix the cement with warm water and pour into radiator, run the engine for ten minutes then every leak in the radiator, water jacket and connections will be permanently stopped. The surplus cement left in the water, closes automatically new leaks that may develop from time to time.

S. C. JOHNSON & SON, Dept. MA RACINE, WIS.

Pints.....\$1.00  
Half-pints... .65

Insist upon your dealer supplying you with Johnson's Radiator Cement. Do not accept any substitute. If he is unable to supply you send your order direct to us and we will prepay the express to any point in the U.S. east of the Rockies.





# MOTOR AGE

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## MOTOR AGE

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Vice-Pres.; W. H. Taylor, Treas.; A. C. Pearson, Secretary.

# "NORMA" PRECISION BALL BEARINGS

(PATENTED)



To have met the super-demands of war times with credit and success—to have maintained a high standard of quality under production conditions imposed by war—these are achievements of which any American manufacturer may well be proud. And these are achievements which will command the confidence of the trade in time of peace.

The records of performance made by American cars, trucks, tractors, power boats and airplanes, in the Great War, make up a notable chapter in the history of national accomplishment. And "NORMA" Bearings, in the magnetos and lighting generators, contributed their share to this record of achievement.

Be SURE. See that your  
Electrical Apparatus is  
"NORMA" Equipped.



## THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings

When Writing to Advertisers, Please Mention Motor Age



# Twice The Work-Half The Expense



## MOLINE UNIVERSAL TRACTOR

ONE man and a Moline-Universal Tractor will do about the same work (taking a season through) as two men with four horse teams."—Crumbaugh Bros., Vandalia, Illinois.

Statements such as this from Moline-Universal owners—and we have many of them—support our claim that the Moline-Universal enables one man to do twice as much work at about half the expense as is possible with horses.

With a Moline-Universal one man can plow 9 acres a day, double disc 27 acres, drill 35 acres, cultivate 15 to 20 acres, mow 25 to 35 acres, and harvest 30 to 35 acres. Figure out for yourself how long this would take with horses.

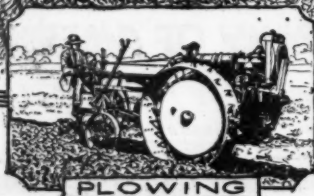
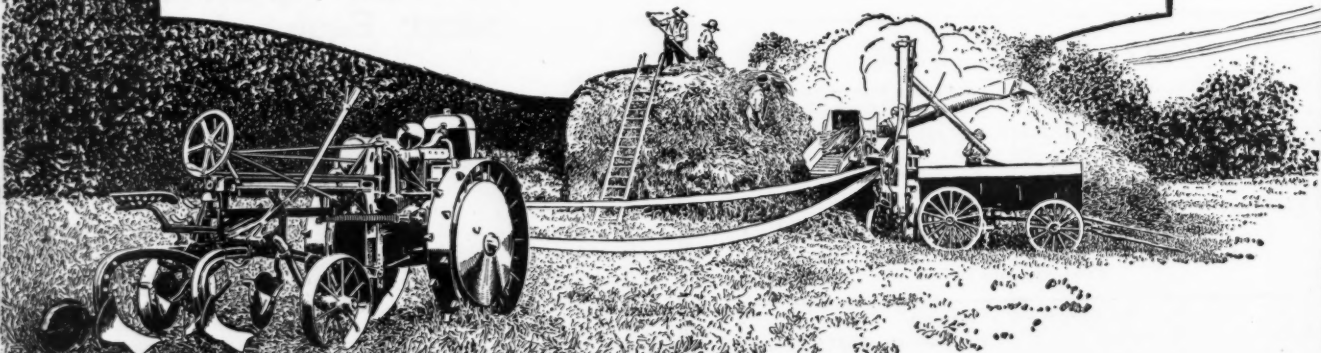
As for expense it runs about half what the same work with horses would cost.

"If I hadn't had the Moline-Universal I would have kept 4 more horses, which are a bigger expense than the tractor," says J. E. Carey, of Wilington, Ohio.

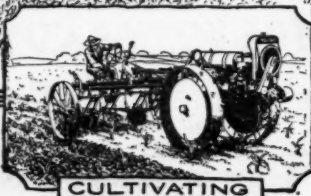
Many other statements similar to this prove that the cost of operating a Moline-Universal Tractor is no greater than maintaining three or four horses, while it will do twice as much work. Then there is another big advantage—belt work. The Moline-Universal has enough power for all ordinary belt power requirements.

With these facts in mind, you will realize at once that the sales possibilities of such a tractor are practically unlimited. There is still territory open for a few good live-wire dealers. Get in touch with us immediately.

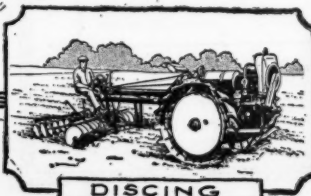
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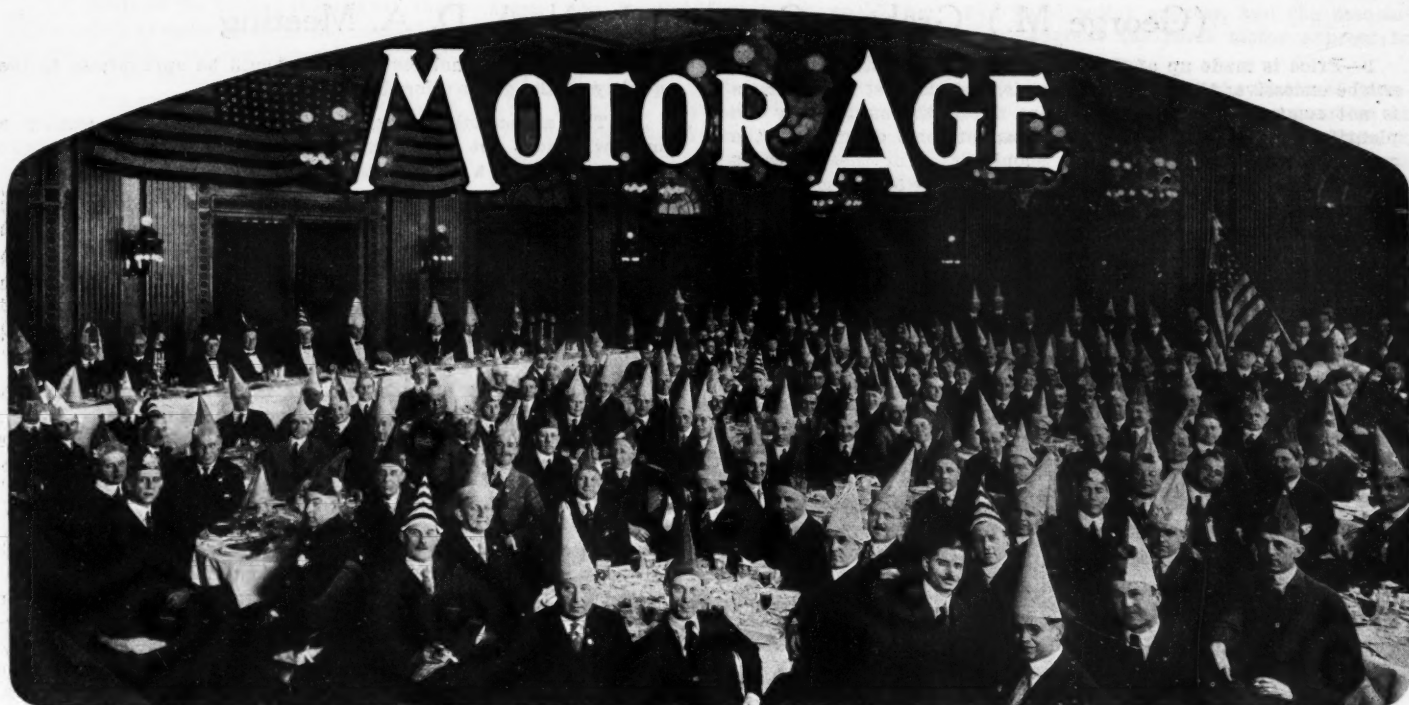
DISCING



MOWING

When Writing to Advertisers, Please Mention Motor Age





The annual convention of the N. A. D. A. wound up with the trade frolic, and this is a general view of the fun and eats—no business—at the big event

## N. A. D. A. Will Use Past Success as Stepping Stone to Greater Organization

*No Change in Policy and No Change in Leader—  
Full Steam Ahead to Country-Wide Membership*

CHICAGO, Jan. 31.—The sanest, most sensible, constructive thing accomplished by the N. A. D. A. at its annual convention at the Hotel La Salle here Tuesday and Wednesday was to re-elect Fred Vesper president of the association. It was no time to swap horses. The N. A. D. A. was in the middle of the stream. It faced the most critical time in its history. Brought within the space of a year from an organization consisting of only a few hundred members to a position where with its nearly 5,000 members it could speak authoritatively and take the position to which it was entitled nationally, it was no time to change men or policies, and the re-election of Mr. Vesper as pres-

By Fred M. Loomis  
*Motor Age Editorial Staff*

ident assures the future growth of the association in size, importance and influence.

The fact is that F. W. A. Vesper has won not only the respect but the affection of the motor car dealers of the country. He has done such unselfish, enthusiastic and successful work for the cause of the motor car dealer that the trade feels that nothing is too good for "Fred." It rarely happens that the announcement of a man's name for office in a purely commercial organization brings men to their feet cheering, nor when the candidate tries to protest is it cus-

tomary to drown his objections with "For he's a jolly good fellow," but these things happened at the Chicago convention, and they testified even more pointedly than did the presentation of a beautiful silver loving cup to him the affection and estimation in which President Vesper is held by the motor car dealers.

The Chicago convention wasted no time in reviewing the past. What has been is gone; what is must be met, and what is to come is the important thing. Therefore, it was what is to come that for the most part interested the delegates, and they listened with avidity to the words of every speaker who had a message to deliver. Generally speaking, this message was one



## (George M.) Graham Gems at the N. A. D. A. Meeting

1—Price is made up of three essentials: A profit, which shall not be excessive; the cost of materials, and the cost of materials is not coming down for the present nor is the supply any too plentiful; the cost of labor, which cannot come down until the cost of living comes down, nor should it. For these reasons it is unlikely that truck prices will be any lower for some time to come and some of the manufacturers practically have guaranteed their present prices for the whole of 1919.

2—From the selling point of view it should be impressed upon the buyer who is seeking to hold off on account of price that it is a business fallacy to sacrifice a sure present profit which will result from the ownership and use of a motor truck for a hypothetical and uncertain profit which may be secured at some indefinite time in the future.

3—The price cutter is the foe of everybody, including himself.

4—I want to see more vanity in the automobile business. The automobile dealer is one of the big merchants in his community, his investment entitles him to that rating. Therefore, the set-

ting in which automobiles are sold should be appropriate to the quality of the goods offered for sale.

5—The automobile dealer should not keep in his employ a man who does not have time to shave in the morning or who does not once in a while change his disguise.

6—Start humbly; don't try to see how much money you can spend on overhead. Let the expansion of the business take care of the increased cost of increased facilities and increased volume.

7—All the war cost can be underwritten and paid for by the development of good roads.

8—Aggressive enterprise spells the difference between stagnation and prosperity in business.

9—There is only one panacea for labor troubles and that is to keep labor employed at proper wages; therefore, it is the duty of automobile dealers to expand and develop their business so that they can employ more labor and so that the manufacturer can employ more labor—that's practical patriotism.

of optimism, confident assurance for the future of the trade and the promise that to the dealer who will get into the swing of things the future can hold naught but success. The message put across by every speaker, each in his own way, was given perhaps the most concrete expression by Edward S. Jordan, who dramatically led up to it in his talk on Tuesday when he left this with the convention:

"There will not be enough automobiles in the world to satisfy the demand after the first warm day of spring."

It is this conviction, that there will be all the trade which every dealer can get cars to handle, that every delegate carried home with him. In short, the motor car trade again is coming into its own and the Chicago convention, coupled with the great Chicago show, put pep and ginger into the trade that has been foreign to it for a long time past.

### Little Chewing of Rag

The Chicago convention was notable in that little time was spent chewing the rag about trade trials, tribulations and troubles. Upon the contrary, it was made remarkable by the character and the meaning of the things that were said to it. George M. Graham, sales manager of Pierce-Arrow, was reassuring and confident in his talk on "Getting Back to Normal." John N. Willys, president of Willys-Overland, in a talk largely of a personal-remembrance order, could see nothing but good things ahead. Edward S. Jordan, president and general manager of the Jordan Motor Car Co., put across one of the best object lessons along constructive publicity and salesmanship any gathering of motor car dealers ever had the privilege of hearing. Henry Paulman, president of the Henry Paulman & Co., Chicago, gave a talk on business methods for the motor car dealer noted for its practicality and common sense. Every other speaker on the program, whether regularly placed or accidental, seemed inspired by the same spirit of optimism and confidence.

Attendance at the convention was not as large perhaps as had been expected, but it was truly representative of the trade both in quality of delegates and territorial dis-

tribution, for nearly every state in the Union was represented and many had come long distances. As one delegate expressed it when he was utilizing the 4 min. accorded him for speaking, "it is costing me just \$150 a minute to make this talk." It was notable that he did not regret the expenditure, and this perhaps will best express the degree of satisfaction experienced by all there—nobody regretted being there.

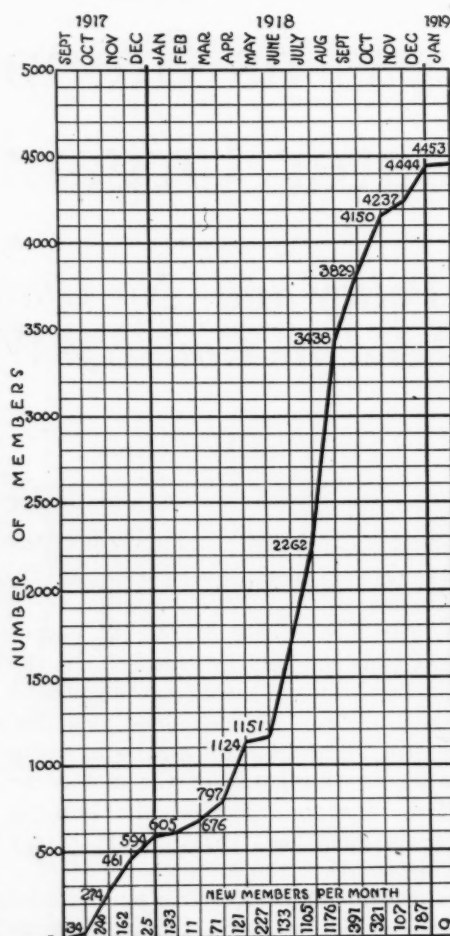
President Vesper, in opening the convention, briefly reviewed the activities of the association during the stress of wartimes in meeting the emergencies which arose both at home and in Washington. Success in getting things the motor car trade wanted

was won in the face of indifference, misapprehension and sometimes positive hostility at the seat of Government. Mr. Vesper called attention to the need of further activity along the lines of education in order that the importance of the motor car dealer as a factor in the commercial prosperity of the country be given proper recognition. In accomplishing this he saw a great field for usefulness for the N. A. D. A.

### Plans for Work Outlined

Harry Moock, who has been secured by the association as business manager, was introduced to the convention and gave a brief but enlightening explanation of the plans outlined for work during the coming year. The work of organization, undertaken last summer by E. E. Peake and interrupted by the epidemic of influenza just when it was going the best, will be continued during the coming year under the direction of Mr. Moock, who has divided the country into districts and has formulated a plan whereby the personnel of the official board, supplementing the work of regular organizers, will cover the entire country during the year to come. The manner in which the country has been divided into districts and the general outline of the plan to be followed in furthering the growth of the organization are given on the map shown herewith. One of the most striking of the exhibits made by Mr. Moock was the chart which shows the growth of the membership through the efforts put forth during the last few months.

After the noon luncheon Tuesday George Graham spoke eloquently to the convention on "Getting Back to Normal." Mr. Graham is a clear thinker and an incisive speaker, and what he had to say was reassuring and inspirational. He began his address by admitting that the automotive trade had not as yet responded to the excitation of peace and that the trade in every department not yet had returned to normal conditions, but he insisted that it was on its way. Two causes for apprehension were having the present effect of slowing up the return to normal. One was the fear lest the Government would dump its alleged surplus stock of automotive equipment upon the market, thus disturbing things and demoralizing the market. The other was the impression prevalent in the minds of the public, more perhaps than



How the membership of the N.A.D.A. has grown since its organization



in the minds of the dealers themselves, that prices were to come down in the immediate future. These two conditions had a tendency to slow things up.

Mr. Graham went into some detail to refute both suppositions. He assured the dealers that there was no likelihood of any of the automotive equipment owned by the Government being dumped. He gave facts and figures as to the probable absorption of all the equipment already in the possession of the Government and that still to be delivered. His conclusions entirely confirmed that reached by the MOTOR AGE and published some weeks ago.

As to prices, Mr. Graham was equally reassuring, basing his conclusions upon the cost of none too plentiful materials, the cost of labor, which hardly can be reduced materially until after the cost of living comes somewhere down to what was normal before war conditions boosted it and upon the necessity of the automotive manufacturer getting a fair profit on his operations. He cited the fact that some manufacturers are guaranteeing prices for months to come. His final conclusion was that the present level of prices would not be seriously affected by declines during 1919.

The major portion of Mr. Graham's address was devoted to suggesting practicable methods of policy and conduct for the motor car dealer who is starting in again to push his trade.

John N. Willys, speaking of "The Automobile Business, Past, Present and Future," in a conversational way told something of the past of the business from his own personal connection with it and made something of an autobiography of his ad-

dress. As to the future he could see nothing but what was promising and attractive to every factor in the industry.

Mr. Willys spoke quite extensively of the labor situation. Personally and officially he announced that he had come to the conclusion that the only effective method of keeping labor contented and to insure labor a fair remuneration was to permit the laborer to share in the profits of his production and that it was the purpose of Willys-Overland to introduce a profit-sharing plan in its plants.

What Mr. Willys sees as the future of the automotive industry is well expressed in his statement that "the motor car manufacturers must motorize every acre of land in this country. To accomplish this there must be motor cars, motor trucks, tractors, farm lighting plants, gasoline engines and the comforts which automotive equipment will bring upon the farm."

The address of Edward S. Jordan, on "The Automotive Dealer's Problems in Sales and Advertising" made a distinct and palpable hit. It was clever, unique, right to the point and delivered as a running comment to a series of charts the speaker used it got across in an impressive and effective manner.

#### Henry Paulman's Talk

Wednesday's session was opened by a talk from Henry Paulman on better business which gave the dealers much practical and valuable advice relative to a better conduct of their business. The substance of what Mr. Paulman said will appear in a subsequent issue of MOTOR AGE.

Short talks were given on good roads

and rural motor express, and the association indorsed the rural motor express as follows:

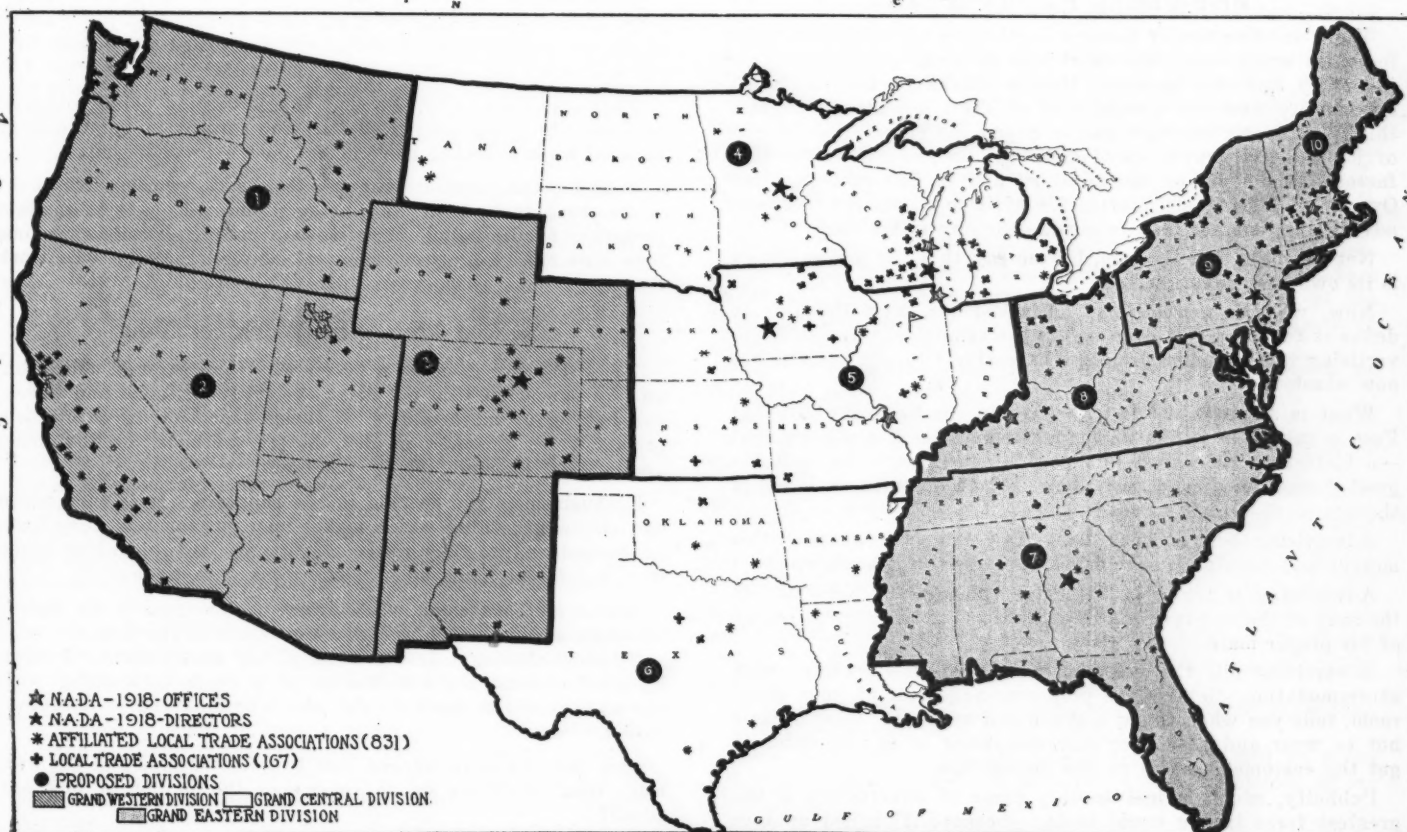
Be it Resolved, That the National Automobile Dealers' Association, assembled at its annual meeting at the Hotel LaSalle in the city of Chicago, indorses the rural motor express as being necessary and essential to the welfare of our nation and suggests that the local associations and dealers throughout the United States lend their aid and influence in the building of a transportation system which will link up rural America with the rest of the world.

The association also resolved that all Government activities with respect to highways be administered by the Federal highways committee and Federal aid to states in road work be increased and the present Federal aid act be amended so state highway departments will co-operate with the Federal highways commission, whereas:

The President of the United States in his recent message to the Congress recognized the value of improved highways in the general transportation of the Nation and definitely recommended and urged their rapid development.

This work is necessary to give employment to our returning soldiers and also to furnish worthy projects on which unemployed labor can be engaged during the period of readjustment.

We recognize the necessity for a well-defined and connected system of improved highways to expedite the distribution of large volumes of foodstuffs now wasted on account of the lack of prompt and adequate highways transportation and to better



How the country has been divided for 1919 campaign. More than 27,000 dealers are eligible to N. A. D. A. membership. It is hoped this plan will bring them all in



serve the economic development of both highways and highway traffic and establish a national highways system.

A formal protest was passed in the form of a resolution against the tax of 5 per cent on cars, parts, tires and accessories and the tax of 3 per cent on trucks and parts with the belief that "if the former tax of 3 per cent on motor vehicles during the period of the war was sufficient, the proposed tax is therefore excessive and discriminatory."

The dealers pledged themselves individually and collectively to employ and secure employment for returned soldiers.

Other resolutions provided for a committee to be appointed by the president

of the association to serve as a conference committee with a like committee from the National Automobile Chamber of Commerce to bring about co-operation between the two associations; thanked the Kansas City Motor Car Dealers' Association for lending the time and assistance of E. E. Peake for the work of organization, and protested against the change from present charges for storage and demurrage recommended by the Industrial Traffic League.

The officers for the coming year beside President Vesper are: First vice-president, E. W. Steenhart, Indianapolis, Ind.; second vice-president, Harry D. Austin, Seattle, Wash.; treasurer, T. J. Hay, Chicago.

George B. Kimball, Boston, Mass.; A. E. Matyby, Philadelphia, Pa.; A. E. Mitzel, Canton, Ohio; George D. McCutcheon, Atlanta, Ga.; W. J. Brace, Kansas City, Mo.; J. A. Graham, Minneapolis, Minn.; H. L. Robertson, Houston, Tex.; P. E. Chamberlain, Denver, Col., and P. H. Greer, San Francisco, Cal., are the directors.

Before Mr. Vesper's re-election to office he was presented by the association with a silver loving cup as a mark of appreciation for the work he had accomplished in behalf of the association and as a mark of the esteem in which he is held by his fellow dealers. The presentation speech was made by E. E. Peake, which is sufficient notice that it was gracefully and eloquently done.

## Ned Jordan's Talk on Dealer Problems

### What's What in Advertising and Sales

WHEN your president, Mr. Vesper, wired me an invitation to speak here to-day on the subject of advertising he told me that Mr. John Willys of the Overland company and Mr. George Graham of Pierce-Arrow would appear on the same program.

I replied, saying that inasmuch as my subject was to be advertising I could have no objection if these gentlemen appeared on the same program with me.

Just to show you that I bear no ill will toward Mr. Willys and really want to help him succeed I am going to give him an idea for his advertising.

May I ask you to note carefully the suggestion I am about to make as, in my opinion, it contains the fundamentals of all good advertising and the essential points of my talk to you this afternoon.

#### Five Family Factors in Sales

There are five family factors which have an important bearing upon every sale. Father thinks in terms of economy—the inventory and the payroll. Mother thinks of her children's opportunity and the possibilities of their success. Daughter thinks of social prestige and a happy marriage. Son thinks of joy and life, travel, speed and "get up and go." The fifth factor is the "pet of the family," and in this case it is the Overland. Now if Mr. Martin Kelley, who writes the Overland advertising, can set that to music—the sky is his limit.

Not to slight Mr. Graham, let me say that the Pierce-Arrow is its own best advertisement.

Now, what is advertising? I asked Mr. Roy Pelletier to define it for me a few days before the armistice. He said "advertising was a custom practiced extensively before the war but now obsolete."

What is advertising? Is it a page in the Saturday Evening Post, a campaign in the Chicago Tribune? Is it a paperweight—a blotter—a letterhead—a free publicity story? Or is it the good things our friends say about us? Gentlemen, it is all of these and thousands more.

Advertising begins when baby first cries his wants to his mother and ends with an epitaph carved upon a headstone.

Advertising is found in the bright plumage of birds and in the song of the meadow lark circularizing the territory in search of his proper mate.

Advertising fills the voice of your telephone operator with accommodation, dictates the proper arrangement of your showroom, tells you when to get a shave and a haircut, what necktie not to wear and tells your salesman what to say in order to get the customer's name on the dotted line.

Publicity, which is just another name of advertising, is the greatest force in the world to-day—because it is just another name for education.

The greatest factors in civilization are labor—or work that

we like to do—education, or knowing how to do work well, and transportation, or delivering the products of our hands and us. Now we all must labor to be happy, and if advertising is education, let us see how we can apply this great force to our own business—that of transportation—the greatest business in the world.

Suppose we begin our advertising campaign by selling ourselves on our own business.

Transportation begins when the child first learns to crawl on the floor. The human instinct is to migrate. Civilization started with the sun rising in the east and has moved through the centuries toward the west.

The horse gave civilization its first great impetus. Then the sailboat and the steamboat added to the movement. Next came the locomotive with its train of cars, and finally the motor car, the truck and the airplane.

Some people still wonder why our business has grown so rapidly. They do not stop to think that we are simply beginning to fill the demand for individual transportation which had been accumulating for 2000 years.

There are those who say that the saturation point will soon be reached. I am convinced that the saturation point will be reached when everyone has one and none ever wears out.

It is a great business—the greatest in the world. We ought to be proud to be in it, and, being proud, we ought to conduct ourselves accordingly. Now we are selling ourselves on our own business. Let us see how we can sell the men who work for us.

#### Selling Men Who Work for You

You will never discover a better way than through education, and by education I do not mean the study of Latin and Greek, engineering or mathematics. I mean education in enthusiasm promoted by friendly rivalry, better methods, profit-sharing and a good example set by the boss.

Enthusiasm is the sparkle in the sapphire. It is that warm and magic something which makes men put the best they have in themselves into their work. Rivalry is the thing which made that wonderful game of baseball what it is to-day.

Better methods come when every boss warms to his men—for then, and only then, will the men warm to the boss.

By profit-sharing I do not mean giving money away. I mean by profit-sharing the distribution of rewards in keeping with the sincere efforts made by the men who make up your organization.

Now that we have learned how to sell ourselves and our own men, what shall we do to encourage the public to buy our goods?

Every man, woman and child in the world is governed entirely by the exercise of what we call the five senses, some-



times six. Nothing has ever happened in the history of the world except through the exercise of these senses, and nothing can ever happen except it is governed by these senses.

Therefore, when we understand their application to our sales and advertising problems, we have learned the simple secret of advertising and selling goods.

There are five senses generally speaking—sight, feeling, atmosphere, taste and hearing—besides a sixth which doctors know about. They call it equilibrium, or balance. This sixth sense depends upon certain little canals in the ear. Alcohol paralyzes them.

Now let us go for a moment into the home of a prospective purchaser on a quiet evening when the whole family is sitting around the living room table. Son sees an advertisement. In it is the suggestion of travel, a more interesting and broader life for him, a little touch of speed and a little touch of "get up and go." He shows it to his sister. She recognizes in the advertisement an opportunity for wider social usefulness and contact with people she most likes to know. She submits it to her mother, who is always solicitous for her children's opportunity. Mother takes the matter up with father at the proper time, and a prospective purchaser is in the making. They decide that on the following day father and mother will drop in to look at the car.

Perhaps they may telephone first and say that they are coming.

The impression made by the telephone operator is quite a factor in the sale.

A little later they walk in the door. Then, gentlemen, the five senses begin to operate.

By the sense of sight the woman gains a picture of the car—the correctness of lines and the strong appeal of colors that are universal. A woman in Barcelona, Spain, once wrote to me asking about the origin of the colors on our cars. I told her that they came from the Garden of Eden when Adam discovered that the apple was red, the sky was blue, the grass was green and all the world was young.

The woman steps forward, and the first physical act is to place her hand upon the leather. If it is smooth and pleasing, she looks down at the rug and then at the back of the front seat.

A moment later she steps in and seats herself on the rear cushion. If her clothing does not bind and she is comfortable, she pictures herself riding with her friends down the boulevard.

Then her husband steps in at the wheel. The levers must be within easy reach and the pedals at the proper angle.

A demonstration is made and the car goes up the hill. A car simply must perform well, not because people insist upon going fast but because every human being loves reserve power and strength. The boy is sold, the daughter is pleased and the family buys the car.

Is the sale over? Is the transaction complete? No, friends, it has just begun.

Then, if the manufacturer has failed in his part; if the advertising has deceived; if the salesman has exaggerated; if the car offends—look out for expensive and damaging advertising.

### Why Certain Cars Lead in Fields

How may we account for the leadership of certain cars in certain fields?

We may account for this when we analyze the various stages by which an individual proceeds from obscurity to success. A business or car succeeds insofar as it is successfully adapted to the needs of a certain class of people.

A man who is tired of walking and riding on street cars or behind a team aspires to own a Ford.

When he reaches the degree of prosperity which enables him to advance a step higher in the social scale, he possibly chooses a Dodge.

Give him a few years of success and savings, and he aspires to pass his neighbor on the hill. This may account for Buick sales. A few more years go by and his wife is concerned with the servant problem. She would like to have a hedge around the front yard, a larger house or a new coat of paint, a Victrola and pretty clothes for the children. Then he becomes a prospect for a distinctive car of style and individuality. Suppose he goes on and on up the scale, earning more and more money all the time.

The day will come when he will choose any car he likes, and then the Packard and the Pierce-Arrow have their inning.

Now what has price to do with the advertising and sale of a motor car?

My answer is—everything below a certain point and nothing above a certain point. There are three merchandising streets in every city: Halsted, where price prevails; State, where equality and price influence the sale, and Michigan avenue, where style predominates.

Therefore, we must select a class of people to whom we are going to sell and remember a thing that has not been remembered enough. No one manufacturer can sell them all.

There are more than 100,000,000 persons in the United States. Only 437,036 pay income tax. Six million farmers are troubled little by that. There are 27,304,177 family groups in the United States. Of these, 7,288,000 families have an income annually of \$850 or less. There are 15,542,000 with an average income between \$850 and \$1,500. There are 2,798,000 with incomes between \$1,500 and \$2,000. There are 1,247,000 with incomes between \$2,000 and \$3,000. There are 157,000 with incomes between \$3,000 and \$5,000. There are 150,500 with incomes between \$5,000 and \$10,000; 67,927 between \$10,000 and \$20,000, and 53,772 between \$20,000 and \$50,000.

We sometimes hear salesmen complain because they cannot sell every prospect. Possibly nine out of ten prospects might not be the right person for the car they sell. The most important thing a merchant has to do is to concentrate his efforts upon that class to which his merchandise is intended to appeal.

### What Has Price to Do With Sales

Now what has price to do with the sale of anything?

Here is a cake of Ivory soap. How much have I paid for it? Some woman may be able to answer that, but if she had to pay a few cents more to get Ivory, she would gladly pay it. It does not sell on price alone.

I have here an Ingersoll watch. Will anyone tell me what the Ingersoll sells for to-day?

How many men in this room can tell me instantly the present price of the leading automobile sold?

About the only thing the public knows to-day about price is that certain manufacturers have seen fit to reduce their prices. I want to say to you that I do not believe it will make any material difference on the first warm day of spring what price your automobile sells for.

The production of the last three months of 1918 was 109,000 cars short of the same period of 1917. If the production of motor cars proceeded on the basis of the last quarter, we would build 300,000 in 1919 as against 1,700,000 in the last normal year.

There is a message which I want to convey to every man in this room to-day. I want to make it forcible—powerful. I want to make it stick. If by some magic in my voice—some wizardry of tone I could make every man of you feel as I feel about this message, the next six months would be the most profitable in the history of our business.

Before I give you this message, let me cite an illustration. Suppose every man in this room should decide upon leaving here to-day to say to every person he met—on the street—at the show—on the trains—in the clubs—anywhere he happened to go—suppose he should say, "Business is rotten."

Can't you imagine what would happen. Business would be more than rotten. A panic might ensue.

Now, listen carefully. I am going to sound the clarion call to all men of backbone, of ambition, of courage and ability in this room.

Suppose we choose a phrase which simply tells the truth. Twelve men sold the whole world on the Christian religion. Suppose we choose a phrase with a little sunshine in it—a little of that warm and magic something which makes life worth living.

Now we are thinking of the phrase. Is there a pessimist, a wise guy in the room? A man who is so clever that he knows the world is going to the dogs. If there be such a man, let him stand and we will hit him like a policeman hits them in the movies.

If you remain seated, then I know you are ready for the phrase. There are no pessimists in the room.

Then we are ready for the phrase which, repeated by every one of us, will make this the greatest year in the history of our business.

Here it is—write it down—

"There will not be enough automobiles in the world to satisfy the demand after the first warm day of spring."



# More Than 400 Kansas City Exhibitors

## Tractors, Plows and Power Farming Machinery in Exhibition

KANSAS CITY, Mo., Feb. 1—The greatest exhibition of tractors, tractor accessories and power farming machinery ever held in America or the world, for that matter, will open in Kansas City Feb. 24 and close March 1. More than 400 different exhibitors, showing hundreds of models and makes of tractors and tractor plows, are to be there. The special building with more than 100,000 sq. ft., which is being erected for the exhibition, promises to stage an extraordinary event that will go down in the annals of tractor history as something unequalled before.

Last year more than 100,000 farmers from ten states attended the 1918 national tractor show, and it is expected that the attendance of the forthcoming show will be much greater. There is every reason to believe it will. Like the motor car and truck show, the tractor show will be held this year in an entirely different atmosphere, of optimism and back-to-business buying. The war resulted in the use of tractors in ever-increasing numbers. American farmers turned to the tractor as never before. This was due partly to the urgent appeal of the Government for patriotic co-operation and partly to the shortage of labor and shortage of horses growing out of war conditions. The result of this situation during war times has been to sell the farmer on the idea of power farming. In view of the additional fact that the need of large food production in this country is as great as ever, if not more so, taking into consideration the needs of Europe, Russia and so on, prospects for Kansas City, as well as for the tractor show at Minneapolis the week preceding, are of the brightest.

### ELKS HOLD SHOW

Muskegon, Mich., Jan. 31—Muskegon will hold its third annual show at the same time Detroit is staging its exhibition, March 3-8. It will be under the auspices of the Elk lodge and will be held in the armory, which has a floor space of 10,000 sq. ft. The two previous shows, both highly successful, were conducted by the Elks.

### BUSINESS PICKS UP

St. Louis, Mo., Jan. 31—For three weeks this vicinity has had spring-like weather and for a week the used-car marts, most of which are conducted without outside solicitation, have been doing a brisk business. Better than that, they have been selling big cars. This means a lot for the used car dealer in clearing up stock. Also it indicates that some persons have gotten over the fear of a Federal wheel tax, of advanced tire prices and gasoline restrictions. Previous to the signing of the armistice the used car demand was all for light cars.

One sales manager here says he has sold fifteen of a heavy car this month so far. His January average for several years is five cars. Another sales manager says that his sales force has averaged good wages

this winter and all are in a good humor. Every man has drawn more than his guarantee. The writer has heard a dozen sales managers say they were already ahead of the January average.

### SEIBERLING AGAIN HEADS L. H.

Detroit, Jan. 31—Henry B. Joy, for four years president of the Lincoln Highway Association, who resigned the first of last year on entering service, has been elected vice-president for 1919. F. A. Seiberling, president of the Goodyear Tire & Rubber Co., was re-elected president. Under Mr. Seiberling's leadership much progress was made in 1918, particularly in western work and the bridging of the desert in Utah, which was financed by Mr. Seiberling personally and his company.

Last year \$2,996,307.77 was spent on the highway, which brings the total amount expended on the Lincoln highway since the organization of the association to \$15,055,392.71. Alvan Macauley, president of the Packard Motor Car Co., was added to the board of directors.

### ASSOCIATED HIGHWAYS NOW

Kansas City, Mo., Jan. 31—The Associated Highways of America is the title of the league of organized and operating highway associations formed here recently. Its purpose is to promote the establishment and construction of a national highway system, to encourage highway associations in constructive work, to bring about establishment of a highway commission at Washington and to stimulate the utilization of the present Federal Aid act in highway improvement.

C. F. Adams, dealer of Chillicothe, Mo., president of the Pike's Peak Ocean-to-Ocean Highway, was elected president, and Frank A. Davis, secretary of the National Old Trails and the King of Trails, was elected secretary. Headquarters will be at the Automobile Club of Kansas City. Each president of a member-highway asso-

ciation is a vice-president of the league; the executive committee, which will transact business and, in subsequent years, elect the officers, includes the presidents and secretaries of the associations.

Forty-eight highway associations met the qualifications for membership in the Associated Highways of America. Thirty-nine were represented at the Kansas City meeting, and their officers signed the charter roll.

The Round Table of Club Presidents helped on local arrangements for the convention, R. C. Greenlease, president of the Kansas City Motor Car Dealers' Association, being chairman of the Round Table committee. E. E. Peake, secretary of the dealers' association, acted as toastmaster at the evening session. A. E. Hutchings, president of the Automobile Club, is treasurer of the Associated Highways.

### MILLIONS FROM MOTORISTS

Boston, Mass., Feb. 1—Because there has been so much talk of jumping the taxes on motor cars and trucks in Massachusetts through legislation the coming year, the Bay State A. A. has secured from the highway commission some figures on what car owners have paid into the state treasury during the last five years. These figures show that in fees and fines alone the state received \$8,224,960.37. When it is figured out that the motor owners also pay personal property taxes on their vehicles, the total must be at least \$15,000,000.

### TEXAS PROSPECTS EXCELLENT

Wichita Falls, Tex., Jan. 31—That the outlook for business during 1919 is brighter than it has been since the beginning of the industry is the general opinion of Wichita Falls dealers and distributors. January, usually a dull month, has shown heavy sales, and prospects point to a still larger business as the year advances. With the majority of dealers the extent of sales has been limited by deliveries. Practically every agency has been unable to supply the demand despite the fact that shipments are being received more promptly now than last year. But with delivery problems being adjusted as they are, it is the opinion of most dealers that the supply can be handled steadily within the next three or four months.



This shows part of the German planes turned over after the armistice



There is a strong demand for roadsters of all makes, as they meet needs and requirements of the oil man much better than the two-seated car. During the last six months local dealers have been unable to secure a sufficient supply to meet the demand. Dodge Brothers and Buick roadsters usually are sold before they arrive. Overland also reports constant calls for this type of car. With the rapid increase in population of the city and surrounding territory and the great amount of wealth that is pouring into this section of the state, dealers see on every side prospects for a banner year.

#### CONTINENTAL IN GOOD SHAPE

Detroit, Jan. 31—The Continental Motors Corp. will close down Feb. 2 for ten days to take inventory. This company has completed its war work and is running at 60 per cent capacity.

The company's annual report shows a prosperous condition. After deducting cancelled Army contracts, the company's books Oct. 31 showed orders amounting to \$19,781,000. In the fiscal year 494 stockholders were added, making 3961.

The company's financial statement shows \$75,000 was added to land investment, principally by purchase of 33 acres adjoining its Muskegon plant, giving that plant 50 acres. Inventory was increased about \$950,000, much of which represents material bought for Government work. In the fiscal year dividends amounting to \$238,281 were paid on the preferred stock and \$1,401,066 on the common. Allowing for dividends and reserves, a balance of \$1,555,610 remained in surplus, an increase of more than \$500,000 over the previous year.

The income statement shows a balance of \$1,939,785.20 for net profits, after allowing \$1,105,760.44 for interest and depreciation charges, reserves and federal income and excess profit taxes, Federal taxes being estimated at \$515,507.76.

#### GRANT TO MAKE 12,000 CARS

Cleveland, Ohio, Jan. 31—The Grant Motor Car Corp. plans the production of 12,000 cars during the coming year. Twenty-five machines are being turned out daily, but plans for increased production already are being put into effect.

#### JORDON PRICES DROP

Cleveland, Ohio, Feb. 3—Announcement has been made by the Jordan Motor Car Co. of a price reduction on five of the company's six models as follows:

MODEL	NEW PRICE	OLD PRICE
Touring .....	\$2,475	\$2,775
Four-passenger sport.....	2,475	2,775
Sedan .....	3,400	3,750
Four-passenger brougham...	3,500	3,750
Town car.....	3,500	3,750

#### GRANT REDUCES PRICE

Cleveland, Ohio, Jan. 31—The Grant Motor Car Corp. this week issues a new schedule of prices to take immediate effect. The new prices reveal a reduction of \$130 on each machine and are:

MODEL	NEW PRICE	OLD PRICE
Touring .....	\$1,120	\$1,242
3-passenger roadster.....	1,120	1,242
3-passenger coupé.....	1,625	1,755
All-Weather sedan.....	1,645	1,775
Demountable sedan.....	1,400	1,530

The Grant Corp. guaranteed its dealers against a price decrease up to May 1.

## U.S. Army Has Sold No Cars or Trucks

### Motor Transport Corps Denies Rumors to Contrary Effect

WASHINGTON, Jan. 31—No passenger cars or motor trucks have been or are being sold by the Army despite all rumors and reports to the contrary. MOTOR AGE makes this statement authoritatively with information directly from the Motor Transport Corps. Various reports have been current throughout the East to the effect that passenger cars are being offered to the public by the Army in lots varying from twelve to 100 and at ridiculous prices ranging from \$300 to \$700. Many of the reports even include the name of an imaginary Army officer, who is credited with offering the vehicles for sale. Army officials here have thoroughly investigated the rumors, probing deeply into the matter but have been unable to determine their origin.

As was announced earlier and officially by the War Department, no passenger cars will be offered for sale and no motor trucks will be placed upon the market. No passenger cars or motor trucks will be placed upon the market except those which are unsuitable for Army use. It is not contemplated to place any which are unsuitable for use on the market at present.

Manufacturers, dealers and car owners can disregard all reports that passenger cars or trucks are being sold by the Army.

#### FONCK TO COME TO U. S.

New York, Feb. 1—It is understood that Lieut. Rene Fonck, the leading French ace, who is also the premier ace of the world, will represent France at the Aero Club of America banquet Feb. 19. At the request of the Foreign Service Committee of the club, he has been granted permission by the French government to represent it and is preparing to come to the United States at once.

#### LE PERE PLANES

Washington, Jan. 31—Two of the latest type American-made scout planes, the Le Pere, have arrived at Bolling Field for test flights. These are the first two planes of this particular model made in the United States and were designed for use of American aviators at the front.

The airplanes are camouflaged green, blue and white, have 430-hp. twelve-cylinder Liberty engines. The planes weigh approximately 3500 lb., with a wing spread of 24 ft. They can climb 22,000 ft. and attain a speed rate of 135 m.p.h.

As soon as the planes are tested they will be sent to aviation training fields for instruction purposes.

#### INVENTORY MOTOR VEHICLES

Washington, Jan. 31—The Motor Transport Corps is engaged in taking an inventory of every motor vehicle owned by the Army and all equipment including spare parts, machine shop parts, machine parts and accessories.

Many motor vehicles had not been taken

over formally by the Motor Transport Corps, having been bought and operated by the Ordnance, Quartermaster, Medical, Signal and other branches of the Army, and inventories never were made. All these machines and their equipment now will be accounted for in the Motor Transport Corps inventory, which is being made by eighty-eight officers and five enlisted men.

The country has been divided into districts, with a district officer in charge at each point. A school has been established for instruction of officers in inventory work.

#### \$200,000,000 FOR ROADS!

Washington, Jan. 31—The Senate post-office committee has reported out the annual postoffice appropriation bill proposing appropriations of \$200,000,000 during the next three years for construction and maintenance of roads and highways.

#### INCREASE ROAD COST LIMITS

Washington, Jan. 31—The House Committee on Roads has reported favorably a bill increasing the limit of cost of roads to be built with Federal aid from \$10,000 to \$15,000 a mile. This action was taken to permit the various states to proceed with projects stopped by the Government's fixing the limit which could be paid for construction at a figure at which no contracts should be placed.

#### DIXIE CAR CHANGES HANDS

Louisville, Ky., Feb. 1—The Kentucky Wagon Mfg. Co. has bought the Dixie Motor Car Co. and will turn out a complete line of passenger cars and motor trucks. For several years the Kentucky Wagon Co. has been making Old Hickory motor trucks. The change in ownership is effective at once.

#### DIEHL TAKES OVER RUSH

Philadelphia, Pa., Feb. 1—The Diehl Motor Truck Works have taken over the business of the Rush Motors Corp., including all properties, machinery and assets. Facilities will be maintained to furnish any new part required for the Rush motor truck. The Diehl company will continue to confine itself to the building of one truck model, a ¾-ton.

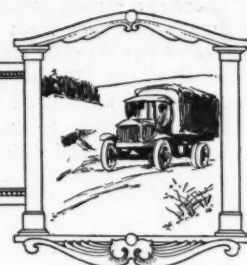
#### AVIATOR LANDS ON ROOF

Paris, Jan. 19—Jules Vedrines won a \$5,000 prize to-day, when he made a landing on the roof of the Galeries Lafayette, a large department store near the St. Lazare station. This is said to be the first time an aviator has made a landing on the roof of a building on a flight. Although the machine was slightly damaged, Vedrines was uninjured. The plane he used is 36 ft. wide, and the roof on which he landed is 52 by 75 ft.





# EDITORIAL



## Why Worry About Show Sales?

**W**HENEVER dealers discuss dealer shows, someone always hops up with the question of whether there will be enough cars sold to pay for them. That always is a short-sighted query, and this year it is absolutely foolish. The direct show sales may be an indication of whether or not the show is doing what it is intended to do, but it certainly is not the basic reason for the exhibition.

**E**VEN the prospects that may be gained at the exhibition space is no more than a method of testing the value of the effort. The intrinsic reason for all such propaganda as shows, contests, stunts, etc., is to arouse interest in cars, whether that be in the form of getting people to come to see them or whether it be in reaching, through the newspapers and trade magazines, people who never would or could come to a show. If a show brings about this result it has not been in vain.

**T**HIS year the far-sighted dealer realizes the increased necessity of such publicity, not alone for the product he may be handling but for motor vehicles and motoring in general.

Eighteen months of war has stopped the flow temporarily of motor car enthusiasm. All admit the practicability of the car but it will take more than mere practicability to make the sales what they should be.

**C**AMPAIGNS for saving, for Liberty Bonds, for the war services, the very atmosphere of wartimes, have taken the "pleasure" out of "pleasure car"—literally and figuratively. While *MOTOR AGE* always has advocated the abandonment of the word "pleasure" as typical of a type of motor car, something must be done to put back into it that broader meaning which includes the health-giving, time-saving atmosphere which has been dimmed by the clouds of war. Shows and contests are the things to do it. If the dealers have to take the lead in these things, they will find the manufacturers lining up behind them in greater strength every week, and they will find the public awakening to the sporting call as the campaign is kept up.

So keep this in mind—

DON'T WORRY ABOUT SHOW SALES

## Modest Rick

**T**HE highest test of true greatness is eternal modesty. It takes a great soul and brain and heart to accomplish great deeds, but it takes a greater one not to be carried away with the honors that are the natural sequence of such deeds.

**I**T is the old modesty of racing days that crops out everywhere with Rickenbacher, who has come home as our ace of aces. Eddie is the same Eddie he was when he burned out connecting rod bearings in the Indianapolis race and drew up, an also-ran, in front of the pits.

**B**ENEATH his Legion of Honor decoration given by France for his work at Chateau Thierry, or beneath his Croix de Guerre with its three palms, each reminding you of its separate deed of valor; or beneath the red, white and blue decoration of our own Distinguished Service cross with no fewer than eight palms, meaning as many separate citations for acts in his plane, he has that same lack of ostentation he exhibited so often when he failed to finish a road race or a speedway race.

**R**ICK realizes as well as we all do that his victories are few compared with Bishop, the premier Canadian with his seventy-two victories and his Victoria cross, Distinguished Service Order medals, his Military cross, and every other decoration that a British aviator can get. He knows how much more such French aviators as Guneymer, Fonck, and such British airmen as Ball, have accomplished, and it is without doubt the good sporting spirit that Rick so often showed in his racing days that has won

for him the name of "Modest Rick" which has so generally been applied to him wherever he goes.

**S**EVEN short months is but a brief space in the span of active life, but much can be crowded into them. While Rick's twenty-six victories stand out to speak for themselves, the world does not know what an expenditure those months represent. He took a squadron when it was in third place in number of Boche victims; he left it the leading squadron of the American forces with sixty-nine Hun machines. It was the esprit de corps developed in the squadron as well as the individual deeds of heroism that make Rick what he is to-day.

**W**E admire him much for what he accomplished as shown by the official records of our Army, but we owe a debt of gratitude for that spirit of fight and vim that he imbued the squadron with and which does not appear in official records. It was that spirit in our Army that turned the tide at Chateau Thierry and won back the Rheims-Soissons salient, it was the spirit that pushed the Boche in September out of the St. Mihiel sector he had held since the autumn of 1914, and it was that spirit that pushed the Allied cause ahead north of Verdun in October and November, when our doughboys proved to Germany what a people of 103,000,000 might be expected to do in another year.

**C**APTAIN RICKENBACHER, with all your honors, we still admire that eternal modesty which is one of the attributes of true spirit. Your friends all hope the Congressional Medal and other honors will be duly awarded you. You freely offered your all. You made good. Bravo!



# Capt. Eddie Rickenbacher, Ace of Aces, Returns

By David Beecroft\*

NEW YORK, Feb. 1—Eddie Rickenbacher, former racing star, returned on the Adriatic to-day as Captain Rickenbacher and as American ace of aces, having twenty-six Hun planes to his credit in the short period of seven months he was on the American front in France. He comes home with more victories than any other aviator in the American service, his closest rival being the late R. Lufberry, shot down in France some months ago, who had eighteen Huns to his credit.

Captain Rickenbacher left his squadron, the 94th, of which he was commander and which was the leading American one with sixty-nine Hun planes the day after Christmas and is proceeding to Washington, D. C., on military orders.

It is not known whether he will remain permanently in this country or not. His squadron, because of its fine work, beginning in the Chateau Thierry show in July and continuing up to the armistice, Nov. 11, was selected to accompany the army of occupation to Coblenz, Germany, a very coveted honor for any squadron.

## His Career Meteoric

Captain Rickenbacher, or Eddie, or Rick, as we still prefer to call him, had a truly meteoric career in the war. He was ordered to the front as an aviator April 14, 1918, and got his first Hun April 29. It was from that date up to November that he won the very highest honor that could come to an American aviator. He chalked up more victories than any of our flyers in the Lafayette squadron which had over three years' experience in France. He proved himself as fearless a fighter against the Boche as he was racing driver on our speedways. In flying he was more fortunate. He had machines, a Nieuport and a Spad, that he could not break up. In his old racing days on Indianapolis and other speedways, he ran the wheels off his cars, burned out bearings and put himself out of the winning.

In aviation his record has been 100 per cent perfect. He has never crashed a single machine. In training he never once broke up a plane, not even breaking a wing or a tail.

His fighting record has been as wonderful. He brought down eighteen Boche planes on his Spad fighter and never crashed or broke up his machine. He never had to have a new rudder or elevator put on. Even the 220-hp. Hispano-Suiza engine lasted him for 120 hr., although the average life of these engines in fighting service was 9 hr. on the American front.

Once Rick was caught in a dog fight—that is what the show is called when eight or ten Boches attack three or four Allied planes. Rick had been out nearly the limit of 2 hr. and 15 min. for which his Nieuport carried gasoline supply when the dog fight started. He finished the scrap, getting one Hun, and then made for across the front line trenches and home. Before he reached the lines, his engine oil was exhausted, the bearings seized and he was



Captain Rickenbacher, American ace of aces

just able to glide across No Man's Land and make a forced landing between rows of barbed wire in an open field. But his pilotship was so expert that even here he did not crash his machine. He tore the tail skid off but did not even crush the landing gear. It was necessary to take the wings off before the plane could be removed to the squadron.

Probabilities that Rickenbacher's service to his country will not be concluded with his return to America are indicated in the announcement by Director of Publicity Wilson, of the Liberty Loan Bureau of the Treasury Department, that for the next month Rickenbacher will pilot a plane in doing stunts in promotion of the Fifth Liberty Loan in Ohio cities.

Rick is accompanied to America by two aces from his 94th Squadron. One is Major Meissner of Brooklyn with eight victories to his credit, and the other is Capt. Douglas Campbell of Mount Hamilton, Colo., who brought down seven Boches as his official record. Both are reporting to aviation headquarters at Washington with Captain Rickenbacher.

When Rickenbacher left his famous 94th at Coblenz the day after Christmas he left it in charge of Reed Chambers who, before going to the war, was the Cadillac agent at Memphis, Tenn. Chambers is now Captain Chambers, with seven victories on the official record.

Some of Rick's other fighting Ninety Fourthers had previous connections with the motor industry, and some were boys fresh from unfinished courses in colleges.

Samuel Kayes, with four Boche victims, was the Ford agent at Columbus, Miss. He is still with the squadron at Coblenz.

Wierd Cook, Anderson, Ind., was one of the college graduates, a mere lad from school, yet he had six victories when Nov. 11 ended the show.

(Concluded on page 17)

NEW YORK, Feb. 1—Capt. Eddie Rickenbacher, America's ace of aces and former racing driver, is, in all probabilities, out of motor racing for good. While his future is quite unsettled and he is only home on official orders to report to headquarters in Washington, he has a strong desire to spend the remainder of his days in aircraft service. His ambitions are not to remain a pilot but may follow either of two possibilities: First, to continue with the army, or Government, in aircraft work, or, second, to go into the commercial end, either in engineering or other work.

Eddie is disappointed with his fellow motor car drivers and the part they played in the war. Previous to going to Europe he spent considerable money and quite a bit of time endeavoring to get the leading race drivers to unite in forming a squadron for fighting. In this he met with nothing but disappointment. They refused to go, and their refusal pierced deeply into the sporting spirit of Rickenbacher. He was always game to the core and imagined many of his fellow drivers were, and when he discovered otherwise his interest in the sport immediately waned.

## Old Love Is Gone

I met him in Paris the morning after his return from Coblenz and when I asked him the question, "Are you going into the Indianapolis race?" there was a pronounced look of disappointment that overspread his face and was equally apparent in his voice. The old love for the 500-mile grind had gone. Its magnetism was history. Eddie had changed his viewpoint regarding motor racing. His answer was that he did not feel he could conscientiously return to the speedways. He had put his entire soul into the war in response to an ideal in life, an idea that was dearer to him than the possibilities of racing fame in an atmosphere that had not responded to the bugle call to action in 1917. His mind was made up even before he left Coblenz, and before he knew Indianapolis was back with its 500 miles and its \$50,000 purse.

There were telegrams awaiting Rickenbacher in Paris asking him to drive at Indianapolis. Louis Coatalen, the manager and racing genius of the Sunbeam Co., in Wolverhampton, England, had two specially built cars waiting for Rickenbacher. In 1916 Rick had spent three months in the Sunbeam experimental factory on these two new racing machines built specially for Indianapolis, and never yet tried out in a race because of the war. Coatalen was a disappointed man when he received from Rick the news that he was out of racing.

A few weeks earlier when at the Fiat factory in Turin, Italy, the question of entering Fiats in Indianapolis was discussed and Rick's name along with Wagner of France was mentioned as one of Fiat's hopes; that hope also fell by the wayside. After Rick has a chance to analyze the future and get a little clearer concept of the future of aviation he may decide to swing back into motor racing, but for the present he is still too close to the events of the past year to take such a step.

\* David Beecroft, directing editor of the Class Journal Co., who has been in Europe several months, and Rickenbacher, returned on the same boat, arriving in New York last week.



# Studebaker Plans a Vast Expansion

Plant with 4,000,000 sq. ft.  
Floor Space—500 Cars a Day

**S**OUTH BEND, Jan. 31—Great expansion of the activities of the Studebaker Corp. was indicated last night in a talk by President A. R. Erskine, at a dinner tendered him by the South Bend chamber of commerce. From Mr. Erskine's remarks it would be gathered that within a few months Studebaker cars will be built completely in South Bend, as well as in Detroit, the production totaling 500 complete cars per day, when the extension plans are in operation.

The factory additions caused by Government contracts under way when the armistice was signed, in which shells, tractors and other munitions were to be produced, will form the beginning of the extension which will cover 61 acres and provide 4,000,000 sq. ft. of floor space, requiring from 7000 to 12,000 employees. The new equipment includes everything from a foundry to the final car assembling, and the plans explained last night contemplate the very latest in modern equipment.

The whole plan, however, hinges on the housing question, for this expansion will mean doubling the present working population of the city, and the chamber of commerce last night started on plans for providing homes for these people.

Housing facilities for 10,000 men and 2000 women will have to be provided, half of whom will be at work by Dec. 1 of this year and the other half six months later.

## ACME TRUCK SEES GOOD YEAR

Cadillac, Mich., Jan. 31—The Acme Motor Truck Co. sees a big manufacturing year ahead. Approximately four trucks are being produced daily. The 1919 production schedule calls for 1400 trucks. The 1919 machine embodies no radical design changes but has been improved upon, however, in several minor respects. The company is anticipating no price reduction and is guaranteeing its distributors against a price cut.

## BRISCOE AFTER FOREIGN BUSINESS

Jackson, Mich., Jan. 31—Although running at 50 per cent capacity, the Briscoe Motor Corp. is now producing thirty cars daily. The company is planning to boost production until the daily average is between sixty and seventy machines. The 1919 schedule calls for 15,000 cars. This company has established an export office at New York and is preparing to engage extensively in foreign trade.

## KING BACK TO CARS

Detroit, Jan. 31—Reconstruction is the big problem before the King Motor Car Co. This company, which was operating 90 per cent on war contracts, was hit hard by the sudden cancellation of the contract work. The company rapidly is getting back into passenger car production again.

Assembly work is now in progress, but completed cars will not be turned out before March 1. At that time production will start with five cars daily.

## 300 DODGES A DAY

Detroit, Jan. 31—Dodge Brothers are turning out 300 machines a day. Their sales officials tell of a rush of orders from all parts of the country which the company is having a hard time to fill. A portion of the big plant is still engaged in war work. The car, being one of the standard makes chosen by the Army, is still being purchased by the Government in considerable numbers. The company also is working on big parts orders for the repair and maintenance of machines in federal service. There are 10,000 men on the payroll. When at full capacity 18,000 men are employed.

## USL WAR ACTIVITIES MANY

Niagara Falls, N. Y., Jan. 31—The U. S. Light & Heat Corp. had 75 per cent of its plant capacity devoted to war work, this percentage including 900 employees. The production of their output was apportioned as follows: Batteries, 10 per cent; parts for tanks, 60 per cent; parts for gas shells, 8 per cent; parts for Army trucks, 1 per cent; parts for airplanes, 1 per cent, and products for the U. S. railroad administration, 5 per cent.

To carry out this program, fifteen of a group of nineteen buildings were devoted to war work, and it was necessary to make two additions to their plant representing 27,960 sq. ft. besides a new building of 17,000 sq. ft. They have been making only 50 per cent of their normal peace-time product.

## JACKSON MAY QUIT CARS

Jackson, Mich., Jan. 31—The Jackson Automobile Co. will not place a passenger car on the market this year. While the company is still undecided on its future policy and will make no formal statement at this time, it is understood that it proposes to devote its entire time to the production of trucks. The company is just winding up a large Government shell contract.

## NEW WESTCOTT SOON

New York, Feb. 3—Special telegram—The Westcott Motor Car Co. is working on a new lighter six, and it is hoped it will be ready in time for the Atlantic City show. It does not differ radically from the heavier six. No price has as yet been set.

The salient features include a Continental 3¼ by 4½ six-cylinder engine, automatic thermostatic water regulation, Fedders radiator, Delco ignition, Borg & Beck clutch, Brown-Lipe gearset, Hotchkiss drive, Timken axles and a Stewart vacuum

fuel feed system. Grease cups have been eliminated. Every part requiring lubrication is supplied with oil fed by wicks. The tire equipment is 33 by 4 both front and rear, and the standard finish on the body and wheels is green. The standard equipment includes a great many features heretofore supplied on cars as extra.

## PATERSON TO SPEED UP

Flint, Mich., Jan. 31—The W. A. Paterson Co. will increase its daily production about April 1. This company is now running twenty cars per week and is preparing to deal more extensively in the foreign market. The new 1919 car varies but slightly from the 1918 model. The company does not plan a price reduction and is guaranteeing to give a distribution sixty days' notice in event such a course is decided upon.

## THREE NEW LANE TRUCKS

Kalamazoo, Mich., Jan. 31—Three new truck models will be brought out this year by the Lane Motor Truck Co. The new trucks, which are 1½-, 2½- and 3½-tons, will not be ready in time for the Chicago show but will make their debut at the Detroit show instead. The company is just getting into production and is turning out one truck daily. Schedule calls for 1000 machines this year, half of which already have been sold. The sales department will extend its activities to foreign fields. It has an agency in Japan and is preparing to establish similar agencies in Australia, Holland, Belgium, France, Brazil, Peru and Chile.

## PAN MEN INDICTED

Chicago, Feb. 1—Indictments against thirteen officers and directors of the Pan Motor Co., St. Cloud, Minn., were returned to-day by the Federal Court, charging the use of mails to defraud. The indictment alleges the concern is a fraudulent stock-promoting scheme promoted by a company which the district attorney's office asserts started on nothing, has never been on a productive basis, never had any assets, not even any patents and never built a tractor, motor car, or truck. It did assemble a few passenger cars at one time.

The concern is incorporated under the laws of Delaware, and the men indicted are Samuel C. Pandolfo, St. Cloud, Minn., president; Norman A. Street and George Heitman, Chicago, patent attorneys; H. S. Wigle, Spokane, Wash., and John Barritt, Charles D. Schwab, Fred Schilplin, Charles Bunnell, George E. Hanscom, Charles F. Ladner, Peter R. Thielman, Hugh Evans and H. C. Revin, Jr., all of St. Cloud. Most of these men, the district attorney's office asserts, are prominent in St. Cloud, where the factory of the corporation was supposed to have been located.

Albuquerque, N. M., was the first scene of operations. Then the concern moved to St. Cloud. Norman A. Street, first president, made Pandolfo "sales fiscal agent." He was to sell all the capital stock at \$10 a share, half to go to Pandolfo. It is charged his share in two years was \$1,500,000. This was shown by an audit.

The indictment further charges that approximately \$5,500,000, including \$250,000



in Liberty bonds, was taken from 50,000 working people throughout the country. A recent financial statement issued by the company, the indictment asserts, claims that the company had a surplus of \$2,500,000, although it never was on a production basis. The surplus, it is charged, was created by capitalizing intangible assets.

This concern has been the subject of many inquiries and criticism for some months, particularly by the Associated Advertising Clubs. A hearing was ordered in May, 1918, by the blue sky commissioners of Minnesota on certain charges preferred by that commission to show cause why the company's license should not be revoked. By a change in the reading of the contracts in the two days between the hearing and the findings of the Minnesota Securities Commission it is alleged the Pan company was able to prevent the revocation of its license and afterward persisted in advertising the findings as "a clean bill of health from beginning to end."

Pandolfo persisted in offering stock for sale in the face of the refusal of the Federal Capital Issues Committee to issue a permit to the company, and Pan Motors was made the subject of a special report to Congress by that committee.

### RICKENBACHER RETURNS

(Concluded from page 15)

An unfortunate member of the 94th was Hamilton Coolidge of Boston, who was shot down when he had eight Huns on his official score.

The squadron, although officially made up of twenty-five planes, was in service composed of twenty-four with about twenty pilots. They all flew Spads type XIII, fitted with Hispano-Suiza engines. The Spad is France's best single-seater scout fighter and has a flying speed of 135 m.p.h. with a driving speed as high as 300 m.p.h. All American fighting scouts used the Spad machine during the last few months. Previous to that many of them used Nieuport Scouts, also French machines, using a rotary air-cooled engine. These were not so recent a fighting creation as the Spad.

Joe Dawson, Denver, Colo., no relation to the old race driver, was another fighting member of the 94th and had six Boches to his record.

### Banquet for Rick

NEW YORK, Feb. 3—Special telegram—Motoring and aviation in America to-night extended a rousing welcome to Capt. Eddie Rickenbacher, America's ace of aces and one time speedway champion. Seven hundred of the big men of the motor industry and motor racing cheered Rick wildly at the dinner in his honor at the Waldorf-Astoria, given by the A. A. A. Contest Board and the New York motor car and aviation organizations.

Secretary of War Baker, Major-General Menoher, assistant secretary of war, Congressman Inland and ex-Congressman Bourke Cochran conveyed the welcome of America to the returned flyer. Rickenbacher's mother shared in the ovation and was presented with a pair of platinum wings set with diamonds and sapphires in deference to her eagle son.

## January Car Production Is 63,246

### 1919 Output for Michigan and Ohio Two-thirds Normal

DETROIT, Jan. 31—Production figures by the leading car makers of Michigan and Ohio, show that approximately 63,246 passenger cars were made during January, even though most of them were below normal production and some were not in production at all. The figures are fairly accurate and show that the delay attendant on reconstruction work very likely will curtail the 1919 output 33 1/3 per cent.

Had normal conditions prevailed, the number of cars made in this district in 1919 would have exceeded the 3,000,000 mark and may even have totaled 3,500,000, manufacturers contend. Delay in contract settlement and in shifting the big plants from a war to a peace-time basis, will cut the estimated production to approximately 2,000,000 machines, unless the trade demands necessitate the adoption of overtime schedules by the larger plants.

Thirty-two manufacturers submitted production figures. Oldsmobile and Chevrolet figures were not available. Packard, White, Jackson and King are not in production. King will start making cars this month. White and Jackson may both produce a passenger car this year.

Ford production is 1300 cars a day, more than half below normal. This company will be hitting the 3000 mark by the middle of March. The production tabulation follows:

Buick .....	100
Briscoe .....	30
Cadillac .....	55
Chalmers .....	30
Columbia .....	8
Dodge .....	300
Dort .....	40
Ford .....	1,300
Harroun .....	4
Hudson .....	30
Essex .....	38
Hupp .....	10
King .....	0
Liberty .....	15
Maxwell .....	150
Oakland .....	160
Overland .....	320
Packard .....	0
Palge .....	50
Reo .....	100
Saxon .....	10
Scripps-Booth .....	20
Olympian .....	4
Jordan .....	5
Winton .....	5
Grant .....	25
White .....	0
Monroe .....	25
Patterson .....	4
Jackson .....	0
Total .....	2,635

### NEW OVERLAND PRICE "MYSTERY"

Detroit, Feb. 3—The price of the new light Overland four to be placed on the market May 1 by Willys-Overland, is one of the main topics of discussion in automotive circles. Since the chassis was introduced at the January show last year, the trade has been waiting for the new machine and a price announcement with more than ordinary interest.

From the Toledo factory comes word that the price will not be made public until the cars are in the hands of the distributors, and Overland is successfully keeping the price plans in the dark, and practically every manufacturer and dealer in low-priced cars is guessing.

Some dealers declare the new machine will sell at a price permitting the company to enter in direct competition with Henry Ford and aver a \$550 price is highly possible. Others say \$650. Overland sales department officials to-day declared both these prices were wrong but will make no price statement.

### GOODRICH SALES \$123,400,000

Akron, Ohio, Feb. 3—The annual report of the B. F. Goodrich Co. shows net sales of \$123,400,000 and net profits of \$15,500,000 before income or excess taxes. For the year ended Dec. 31, 1917, the net sales of the company amounted to \$87,155,072 and the net profits \$10,544,677.

### FORD ENTERS TIRE FIELD

Detroit, Feb. 3—Henry Ford is now making rubber tires for his cars. The Ford Motor Co. has built and is operating a small tire factory and is producing tires on a small scale. Only a few tires have been made to date, but plans call for the extensive manufacture when additional facilities are secured.

### MORE OVERLANDS DAILY

Toledo, Ohio, Feb. 3—Willys-Overland has increased its daily production for February to 400 cars. During January the plant's daily average was 320 finished jobs. Odds and ends of war work are being cleaned up and reconstruction is about complete. The company is now operating at 75 per cent capacity. It will be July at least before full production of 600 cars daily will be obtained.

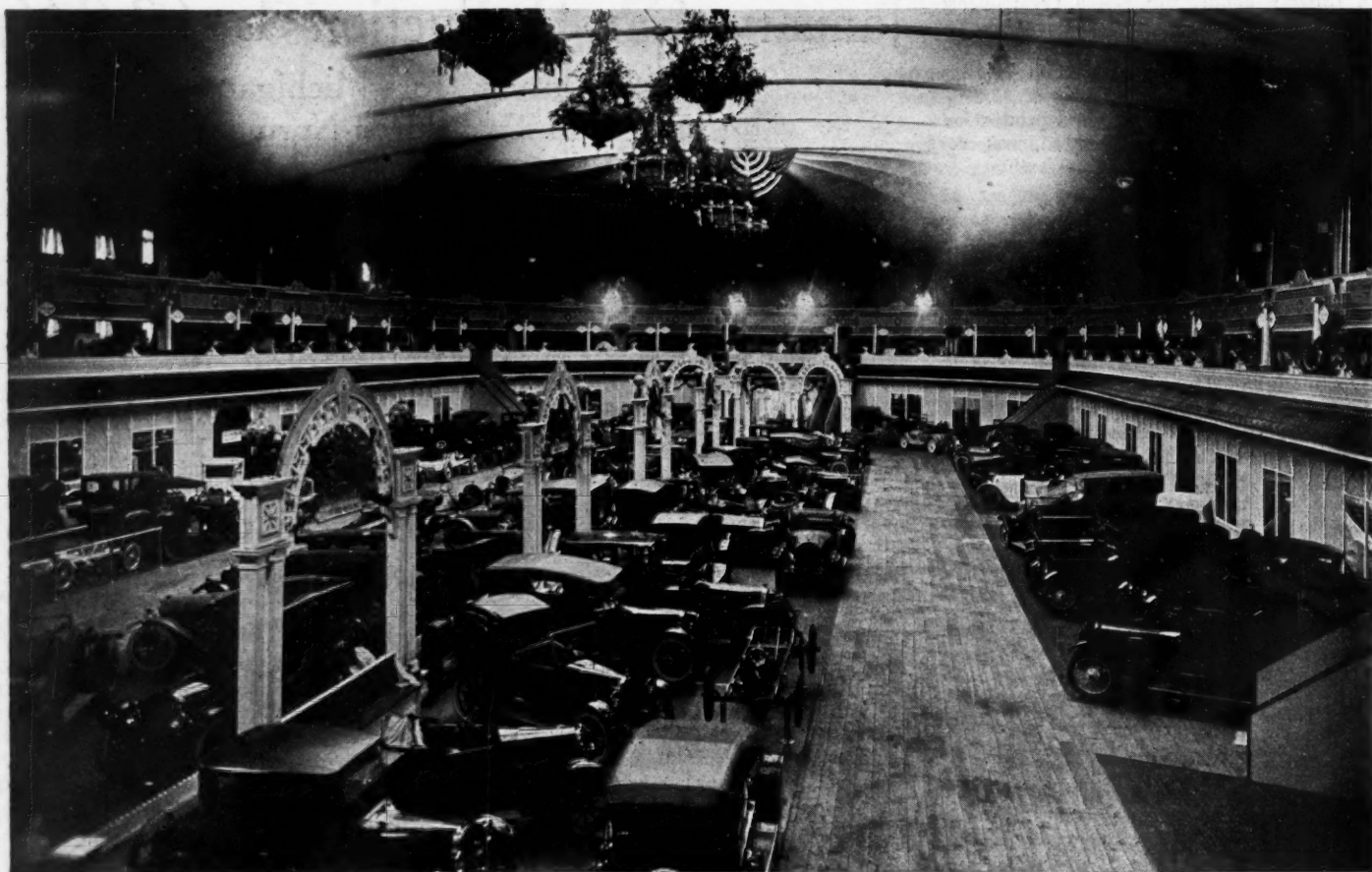
### PROGRESS OF JOBBERS' TRIAL

New York, Feb. 3—Special telegram—The prosecution completed its case in the suit against the jobbers' association last week and the defense opened by placing Sidney F. Beech, president of the Motor Car Supply Co., Chicago, and the first president of the association on the stand. Mr. Beech testified for a day and a half, being examined by the attorneys for the defense and cross-examined by the prosecution. He was followed by T. M. Brooke, head of the Automobile Supply Co., Chicago, and second president of the association, who completed his testimony to-day, ending with a cross-examination by the prosecution.

The third president of the association, C. F. Faeth, Motor & Machinists' Supply Co., Kansas City, Mo., opened his testimony this afternoon.

That the nineteen defendants all may be called upon for testimony and that the case may take days or possibly weeks for completion is the present opinion. Commissioner W. M. Webster, who was considered as the first witness for the defense, became ill early last week and was unable to appear until to-day. Thus far a weighty mass of testimony has accrued, but no important action with it.





The decorations in Madison Square Garden are cheerful and effective with alternate panels and large mirrors

## Garden Show the Real Thing

*New York Gives Final Proof  
to Success of Dealer Events*

By Darwin S. Hatch

Managing Editor Motor Age

NEW YORK, Feb. 3—That motor car dealer organizations can stage the annual exhibitions in the large cities in a style which compare favorably with that of the makers' organization is given final proof in the almost certain success of the nineteenth annual New York show, which opened Saturday night. This was predicted last week after the Chicago dealers had carried through the Chicago exhibition, promoting and preparing it within a space of thirty days. The New York dealers have equalled Chicago's record in catching up the mantle discarded by the National Automobile Chamber of Commerce when the latter organization decided not to promote the two show classics.

### Garden Comes Back

The old Madison Square Garden has come back into its own after a period of several years and after it was predicted that never again would the historic building see a motor car exhibition. But war upsets many predictions and, by making impossible the use of the Grand Central Palace, which for the last few years has carried wholly or in part, the annual show, has made the Garden again the scene of the motor car show. In addition it is necessary this year to use also the 69th Regiment Armory, which is

closer to Madison Square Garden than is the First Regiment Armory in Chicago to the Coliseum, but because it is across the street there is no possibility for the connecting link that exists in the shape of "Pneumonia Alley" between the two main buildings of the Chicago affair.

Madison Square Garden came back with a bang and in really more beautiful setting than it ever has in the past. The architectural features of the Grand Central Palace has made unnecessary any very extensive special decoration, but the Garden not only lends itself to the decorator's art, but special treatment is required to produce effects consonant with a showing of motor products. The effect in both the Garden and the Armory is more pleasing, though less ornate, than the Chicago dealers achieved in the Coliseum. Incidentally, it probably was much less expensive.

The organization which is staging the New York exhibition is the New York Automobile Dealers' Association, with Charles A. Stewart, general manager of the show.

This is the first time in a decade that the veteran show manager Samuel A. Miles,

whose hand was at the helm in Chicago, has not guided the destinies of Gotham's affair. Manager Stewart, with his associates, has succeeded in putting on a show which in setting, in arrangement and appearance of exhibits and in the size of the crowd on the first night, anyway, lives up to all traditions of the makers' shows of previous years.

Saturday night saw every available inch of space jammed with people, and if the opening night crowd is any criterion of attendance for the week, and it usually is so considered, the dealers will finish up the week with a large financial credit. Inasmuch as the business done at the show in the matter of closing contracts with dealers and getting direct retail sales and prospects to a certain extent is dependent on the attendance.

### Will Achieve Purpose

In any event, the big crowd to be expected from Saturday night's showing will achieve the real purpose of motor car exhibitions, even though no immediate business be developed at the show. It will bring back to the minds of the people the motor car, and if it achieves no other object it will have been successful by re-



awakening the buying impulse which has been put to sleep by eighteen months of war and its restrictions.

The Madison Square Garden is not quite as crowded with cars as it used to be during the last few years of its regime as the site of the annual New York show. The additional space afforded by the armory permitted more space to be given to individual exhibitors so that a better arrangement of the cars for exhibition purposes could be made, and as a whole the effect before the doors opened and the aisles became glutted with people was more pleasing than it has been for a number of years. Had there been more cars, it would have been necessary to lock the doors because not only the first floor but the balcony was jammed, and so was the armory.

Of course, the first night of a motor car show, like that of most other exhibitions, represents a larger proportion of passes and complimentary tickets than do later sessions. But while no official figures as to the attendance or gate receipts are given out as yet, it is certain that there were enough paying visitors to assure the success of the exhibition from the standpoint of gate receipts. At 8 o'clock, when the doors were officially opened, the sidewalks for half a block were jammed with people trying either to buy tickets or to pay war tax on their complementaries, and a squad of policemen were kept busy in keeping the crowd from overflowing all over the street. That is a sight that gladdens the heart of the show manager.

#### Transfer to Armory

Arrangements for interchange of visitors between the Garden and the Armory could have been improved materially in one respect—and probably will be another year. The methods used in the past whereby one admission would let visitors into both the Madison Square Garden and the Grand Central Palace were used this year. This consisted of a stub which, when the ticket is taken up at the door of one building, admits the visitor to the other building. Such arrangement was made necessary in the past by the distance intervening between the Garden and the Palace. This year, however, the Armory is close enough to the Garden so that the scheme used at Chicago could have been employed with better results.

Chicago's method is to have one admission ticket and issue passes which are time-stamped and which are good for a few minutes, so that visitors may pass backward and forward between the buildings as many times as desired on one admission. Here, however, if you have been in one building and visit the other there is no means of returning without paying a second admission.

Decorations in the Garden are more cheerful and more effective than those in the Coliseum a week ago. The walls about the main arena floor have alternate paneling and large mirrors, and the portion beneath the balcony is illuminated with indirect lighting; the color scheme is cream and white with shades of blue. The pillars which rise to the girders are decorated in blue and white lattice work, with forty-eight Old English wrought-iron lanterns hanging from them. At either end of the garden hang blue French curtains which



Many accessories are at New York, but less space is given them



Hudson and Essex had the concert hall in the Garden. The white car in the background is one of the Essexes

merge into the valance of dark blue that forms the ceiling. The Armory decorations are carried out along much the same scheme.

Individual exhibits in general have been worked out to as good an advantage as in the past. The lack of crowding has permitted better display of the cars and full advantage has been taken by the dealers of New York's custom-body industry. Consequently the proportion of special body jobs is greater than it was at Chicago.

Among the special bodies worthy of attention are a Pierce-Arrow sporting-type Victoria finished in cream and blue; a Lexington touring car in robin's egg blue and cream; Apperson and Kissel Silver specials; a Cunningham sport tourist; a Paige tourist, whose headlight lenses are V-shaped with one side of the V frosted so that a direct light is thrown to the right and a diffused light to the left, thus removing the glare from an approaching driver but giving a brilliant light at the side of the roadway, where it is needed. A Packard sedan is shown finished in nickel and blue; in fact, there is an exceptional amount of bright work and nickel throughout the show as a whole.

There is only one new car to be seen this time, and this is the Noma, made by the Noma Motor Corp., a newcomer in the industry. Mitchell's new model is expected to appear to-day. This was to be exhibited first at Chicago but did not arrive in time to appear at the Coliseum. The Chicago dealer contented himself with displaying it at his salesroom. Packard has two Liberty engines as features in this exhibit, one at the Armory and the other at the Garden.

Of the many well-arranged exhibits, the feature is that of the Hudson Motor Car Co. of New York, dealer in Hudson and Essex cars. The entire concert hall—a special room of ample dimensions off the main floor of the Garden—was taken, specially treated as to decorations but carrying out the same general effect as that of the main hall, fitted up with comfortable chairs and a couple of stenographers and such conveniences as a visiting sub-dealer or owner might appreciate. With this setting there were displayed ten complete Essex and Hudson cars, as well as the chassis of the new Essex which made its debut at Los Angeles, re-appeared at Chicago and has a third showing here.



As is to be expected, the number of exhibitors is not as great as it has been in recent years at New York; neither did the space permit or the conditions allow as large an exhibitor's list as previously. Too many manufacturers of cars, parts and accessories have been so thoroughly engaged in war work that new designs have not been developed as yet. Comparing the exhibitor list this year with that of the Grand Cen-

tral Palace in January last year, there is a total of 198 for the present show as compared with 331 a year ago. Of these fifty-six are car exhibitors this year and seventy-nine last year. Accessory exhibitors this year total 141 and one motorcycle, as against 252 accessory exhibitors at the show last year.

The New York show does not come up quite in the point of number of exhibitors

to the Chicago show, as the latter totaled 203, of which sixty-eight had cars on display. For the first time, however, New York outshines Chicago in the point of accessory exhibitors, having four more than there were recorded in the Windy City last week.

The passenger car session winds up next Saturday and the truck session opens Monday, Feb. 10, and runs for the week.

## Special Bodies at New York

By J. Edward Schipper

THE New York show, like the Chicago show, did not produce anything radical from a technical standpoint as far as chassis are concerned. On the other hand, the ingenuity in body work was far more developed than at the Chicago show, and in form and color the bodies on the floor of the New York exhibit were probably the best designed and most artistic gathering of coach work ever shown on the floor of an American passenger car show.

Makers who visit the show are bound to leave with an impression that there is much to be done in standard body work to meet the demand for individuality which is gathering force year by year in the minds of American car users. It can be predicted that the day of the plain black touring car is disappearing, and in its place there will come a line of standard bodies bringing out the desirable features exhibited by the display given by the dealers of the metropolitan district this week.

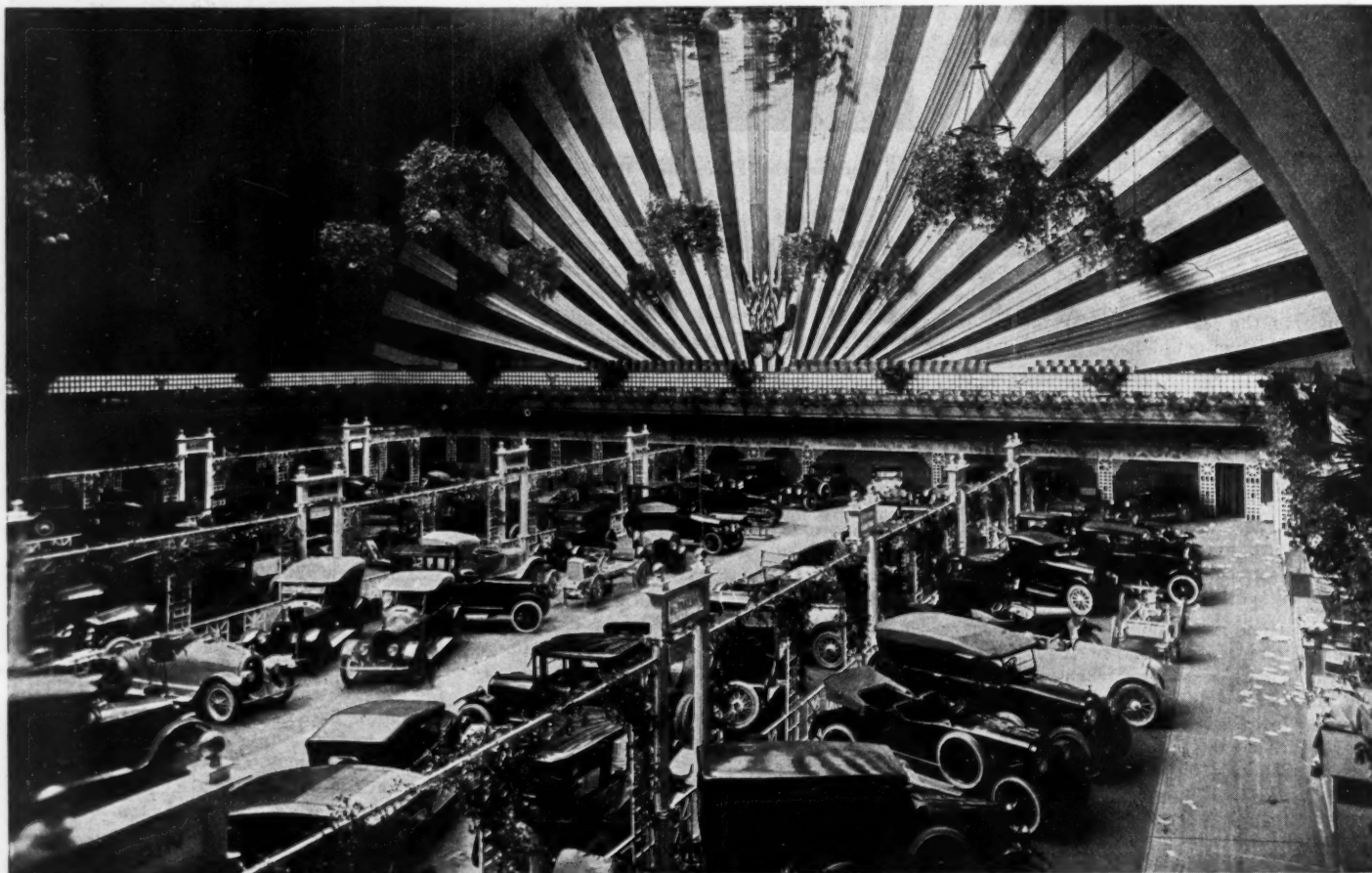
The production last year of a number of four-passenger cars really marked the first step in departing from the straight

touring type and falling into line with the demand for a distinctive sport type. In Europe the sport type of car has had its place for years, and there is little doubt but what a well designed car of this type equipped with the fittings necessary to a vehicle intended for country club or week end use would fit an existing demand.

In this body respect the New York show clearly illustrated the difference between the Eastern idea of the car and the Central. At the Chicago show there were a few special bodies, it is true, and there was much more color work than usually seen at a Chicago show, but at the New York show this was carried to a degree far surpassing anything seen at a national exhibit since the day when the crimson touring car, with its black line striping, was in fashion. Not only in color work was the difference to be found, but in the actual shape of the bodies clearly showing that the New York dealer, with his intimate knowledge of what the 10,000,000 people living in his

territory desire, did not believe that the standard type of body is a sufficiently powerful sales attraction.

The New York dealer has gone to special bodies. Many exhibits on the floor do not include a single body of standard type. Poertner, handling the National, departed radically from the standard type of body and showed a line of cars which was special from one end to the other. Others did likewise, with a result that the show fairly scintillated with brilliant body ideas. These bodies cannot fail to make an impression on the visiting manufacturer. He is going to see the New York dealers' interpretation of the motor car desires of a tenth of the country's population. Here along the Atlantic seaboard dwell the most fastidious car buyers in the country. They are largely composed of metropolitan dwellers who have no opportunity to utilize their cars as a matter of daily business. The condition is different from the Middle West, where it is common practice to use the car as a regular means of transportation between house and business place.



A huge sunburst is a feature of the Armory decorations for the New York show

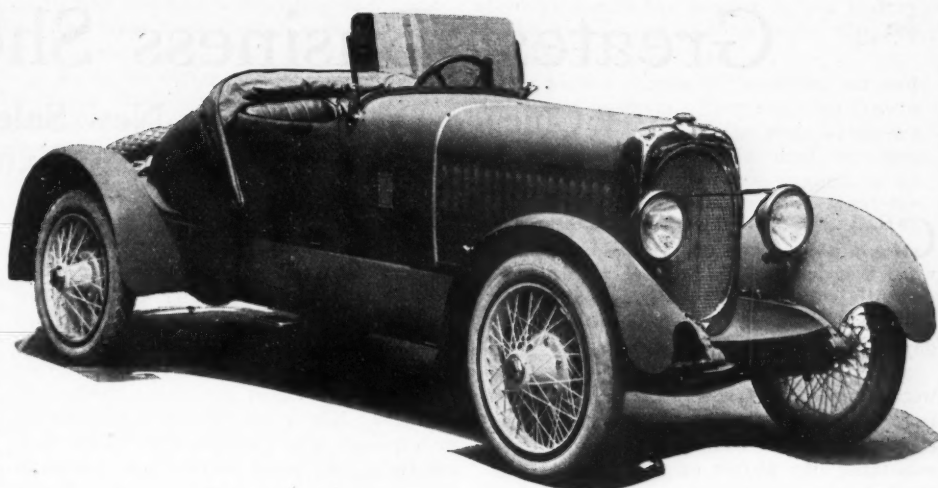


With this condition, it is but natural that the cars shown at New York would indicate a larger following for the sport type of vehicle. Nevertheless, the demand is not by any means confined to the eastern area, even though it predominates there. It is quite certain that manufacturers who visit this show are going to leave with a marked interest in the car which shows an amount of individuality not hitherto found in stock designs.

It is not possible to incorporate in the stock body all the individuality of a special design. When a few thousand cars of one type are produced, a certain degree of individuality is lost. The car which is a stock design to-day would have had marked individuality if it appeared on the street among the cars of ten years ago. There is, however, a good opportunity for development in originality among makers, so that the body of one manufacturer need not always follow the exact line of those of another manufacturer. It is regrettable that hitherto when one manufacturer has secured an idea which proves popular, others are too prone to fall in line and copy, not realizing that not only does a copy always create a bad impression, but it has the effect of making what was an individual type a matter of common usage.

Another thought which is immediately suggested as a matter of merchandising is that the interest in bodies of individuality is a remarkable sales stimulant. One cannot but be struck by the much more extended use of the special body along Fifth avenue, New York, as compared with Euclid avenue, Cleveland, for instance, or Woodward avenue, Detroit. It must not be forgotten that an up-to-date car in the minds of the general public generally is symbolized by an up-to-date body, and New York dealers have found it extremely profitable to have the special bodies built practically creating a new line of cars such as the Silver-Apperson or Silver-Kissel.

All of this must suggest to the manufacturer that if he can break away success-



The Noma was the only really new car at New York

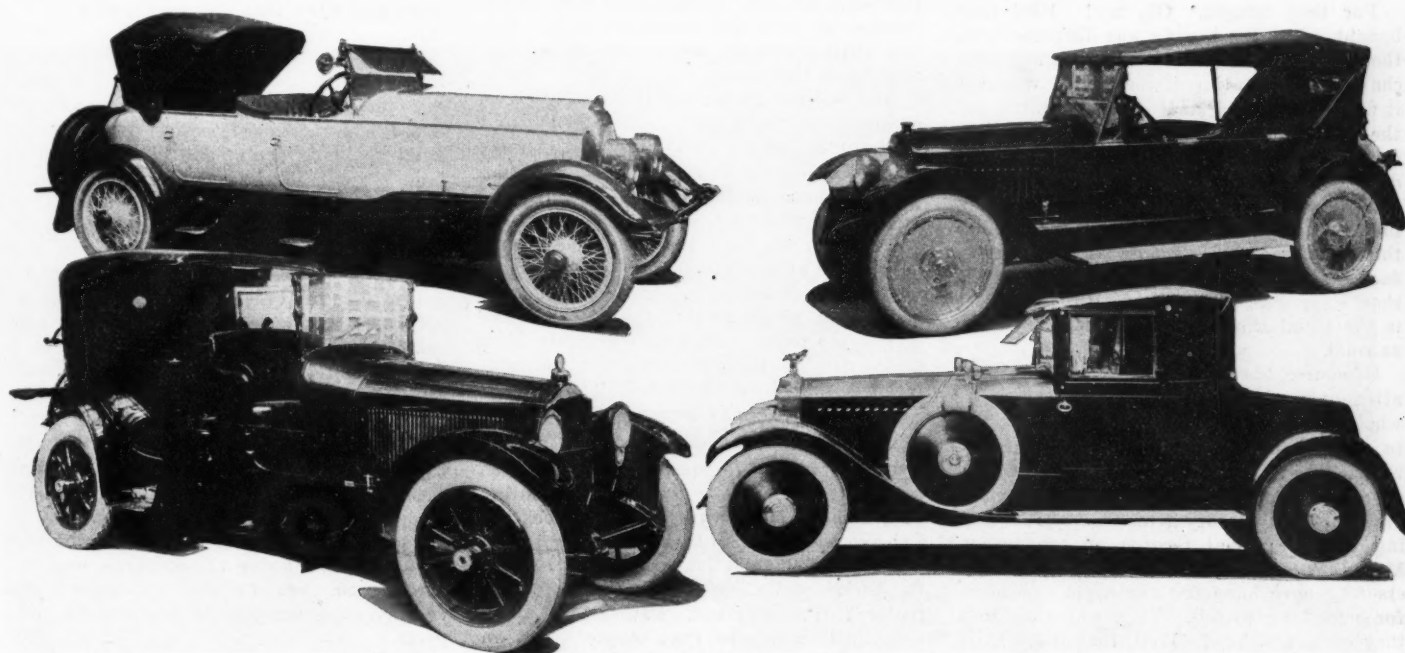
fully from the common line of bodies and produce something of distinction, without freakishness, he has immediately created a powerful sales stimulant not only for himself but for his dealers, because the same principle works out in both the wholesale and retail market.

One new assembled car has made its appearance, this being a New York concern, the Noma Motor Corp., which is planning to produce 500 during the year. The car is exhibited as a sport roadster with a turtle-back deck at the rear, giving a noteworthy type of sport car to sell for \$2,500. It incorporates a Continental model 7W, six-cylinder engine, a Detroit three-speed gearset, Standard axles and a Gemmer steering gear. The wheelbase is 128 in. and the wheels are wire, fitted with 32 by 4½ in. tires. The car is to be produced in the Ammann's factory, which during the last year has devoted its 150,000 sq. ft. of floor space to the production of airplane parts for the government.

The Noma company is headed by W. W. Walton, who within the last two weeks resigned the presidency of the Walton Body

Co. to become president of the new company. Associated with him are F. Ammann, Sr., treasurer, and F. Ammann, Jr., vice-president and secretary.

In studying the chassis present at New York but not at Chicago, the same ideas of a technical nature are borne out. From the chassis standpoint, lubrication of the chassis parts and a study of the best means of pre-heating the air to take care of the present low grade of gasoline are the two outstanding features. About 40 per cent of the cars on the floor use oil cups instead of grease cups for spring shackle lubrication; about 3 per cent use oil cups for the steering knuckle pin and about 5 per cent use a self-lubricating bushing at the shackles, requiring neither grease nor oil cups. It may be noted that where oil cups are used, manufacturers seem to think that these have to be as large as the grease cups which they replace, whereas a very small oil cup which is much more sightly will do the work as well. Probably as good an example as can be found on the floor is the Franklin oil cup, which is small and well-protected.



New York dealers went in strong for special bodies, as this group indicates. The cars are: Upper left, Pierce-Arrow; upper right, Westcott; lower left, Packard with Holbrook body; lower right, Rolls-Royce with Brooks-Ostruk body



# Greatest Business Show Ever

## Chicago Dealers Make New Sales Records During Passenger Car Exhibition

CHICAGO, Feb. 1.—“The greatest business show Chicago ever held”—that’s what everybody says who had anything to do with Chicago’s “own” passenger car show, which closed at midnight last Saturday night.

*And the crowds!* From the time the doors were open on the first day until the last visitor was shooed out eight days later, the crowds came and continued to come. The something like 30,000 of the first day was swelled to a 40,000 count on the last day, and first and last nearly a quarter of a million persons, 220,000 at the lowest estimate, thronged the Coliseum, the Annex and the Armory during the week. This is a brand new record for Chicago shows.

*And the weather!* Did anyone ever see such glorious weather for this time of the year? Spring was in the air. Old Boreas hid his hoary locks somewhere north of Medicine Hat or in some other hyperborean retreat, while morning after morning rosy-cheeked Aurora drove her shining steeds up over the lake and gentle Zephyr breathed soft airs into smoky old Chicago, filling every man, woman and child with a desire of out of doors. Whether it is true that someone saw the first robin of spring out in Oak Park, or plucked the first violet of the season or found the timorous hepatica shyly peeping forth in some sheltered nook out by the Calumet, it is impossible to say, but with robin and violet and hepatica comes the desire to get out, and in this day and age getting out means the motor car. It was this desire and this feeling that were manifested by the thousands who came to the show and who gave expression to their feeling by buying motor cars.

### How Visitors Bought

For they bought. Oh, my! How they bought. And the buying was different from that ever experienced before, because the characteristic feature of the buying was that it was retail buying and with an intent to put the cars immediately into commission. The cars actually sold at retail, both those on display at the show and others from the retail salesrooms along the row, buying in both instances being inspired by the show, ran into the hundreds. This fact dwarfs the further fact that the wholesale orders taken at the show aggregate thousands, for the latter fact is the usual thing, while the former is the unusual.

Of course, the distributors expected a large attendance of dealers and a large volume of wholesale trade. This is the customary thing to expect and this year there was even more reason to expect it than usual. The war is over. Restrictions on motor car production are removed. Factory after factory is swinging toward normal records of production. Motor cars once more are available for dealers who have hungered for a year or more for something to sell. Then why shouldn’t they come and buy? Well, they did. It is impossible at this time to gather even an approximate estimate of the number of cars

ordered by the throngs of dealers who came to the show. “We are fully satisfied with the results,” is a composite expression which covers what every distributor down the row says, and when everybody is fully satisfied then surely the trade must have been heavy.

But after all it was the retail buying which was the most gratifying feature of the show. Nor is this difficult to account for in a general way. People want motor cars, but for a good many reasons their desires in this direction have been repressed during the last year or so. It’s not necessary to recount the reasons why—they have been obvious. But with the armistice signed and with hundreds of motor cars in glittering array awaiting their approval at the Coliseum, the desire to possess came back with a bound and the buying followed as a matter of course.

But two other reasons, peculiar to this greatest of Chicago shows, had their effect. One was that there was nothing on display that was not practical and ready for instant use. There were no show cars calculated to make one stand and enviously yearn for the unattainable nor to hide the practical behind a show of impossible luxury. No, every car there was the real thing, each in its individual class within the reach of the purse fitted to it and ready to jump into and ride away with. This stimulated immediate decision and instant purchase.

Then there was the atmosphere of the show. It was warm-blooded. It was a glad-hand affair. One couldn’t stop at a car but that almost instantly a glad young voice was at one’s ear inquiring if one were interested. The manager, the salesman, or whoever he might be, was on the job, glad you came, pleased to show and explain and sure you wanted a car. People liked that. They warmed up to it and responded to it. This was distinctively the atmosphere of the Chicago show this year.

And visitors recognized it. Fred Vesper, president of the N. A. D. A., noticed it and said, “I’ve noticed myself, and some of my dealers who have been here also have noticed and have mentioned it to me, that there is a different aspect, attitude, call it what you will, to the show this year than I ever have found at previous Chicago shows. There isn’t that cold blooded indifference, that stand-offish air, that shows sometimes have had in the past. This time everybody is on tiptoe and on the job. It’s the warmest-blooded show I ever attended.” And what Fred Vesper felt may be regarded as typical of what everybody else felt.

Who or what is responsible for it? It was run by a national show manager, Sam Miles. It was made up of cars from the stocks of Chicago dealers, all of whom belong to the Chicago Automobile Trade Association. Was the major credit due to either one of these factors? Probably not. Rather to a happy co-ordination of the two, coupled with an appropriate social and business setting and the magnificent weather. Anyway, both Sam

Miles and the trade association are inclined to swap compliments. Sam Miles says the thing would have been impossible without the hearty co-operation of the Chicago dealers. The association says it would have been impossible without the experience and ability of Sam Miles as show manager. And there you are. But to whomsoever the credit should go, it was Chicago’s greatest and most successful show.

What of the future—what will be done next year? George H. Bird, president of the Chicago Automobile Trade Association, says that next year’s show, and all subsequent shows in Chicago, should be national shows in the widest sense of the term but that they should be put on with the co-operation of the association and with the association on a basis of participation. Mr. Bird says Chicago is the most important distributive center for automotive equipment in the country and as such should have the really big national show. Co-operation between the National Automobile Chamber of Commerce and the Chicago Automobile Trade Association upon an equitable basis of participation will insure such a show, and that is what Mr. Bird wants, and that, apparently, is what most of the Chicago dealers want. What Chicago men really want they usually get, so why worry about the future?

### What Dealers Did

As an indication of what the Chicago show meant to Chicago motor car dealers in a business way a few typical reports may be cited:

Charles J. Simmons, president of the Simmons Motor Co., distributor of the Grant, says it was *the greatest business show Chicago ever held*. From fifteen to eighteen cars were sold at retail on the floor of the Coliseum and more than 250 were sold at wholesale.

M. W. Hard, sales director of the Lexington Chicago Co., distributor of the Lexington, says the show was very satisfactory and produced many prospects. The dealer attendance was satisfactory and many leads were laid. It was the best buying show Chicago ever held.

George H. Bird, of the Bird-Sykes Co., showing the Paige, says the show was from 200 to 300 per cent better than any ever before held in Chicago. It resulted in reviving interest in the motor car and as a result *the company sold from twenty-five to thirty cars at retail and more than 300 wholesale*.

Frank H. Sanders of the Franklin says it was the best show by 100 per cent that Chicago ever held and that it resulted in *at least twenty-nine retail sales* for his company. The dealer attendance was satisfactory.

Jay A. Colvin, president of the Triangle Motors, Inc., showing the Stephens, was very enthusiastic about the show and says that it *resulted in securing more than 700 live prospects*.

C. E. Gregory, secretary of the James Levy Motors Corp., showing the Buick, said



that more than \$50,000 worth of cars were sold at the show, none of which would be delivered later than March 15.

J. G. Winterbotham of Edgar C. Ferdy, Inc., showing the Cole, says that six actual retail sales were made and the crop of prospects never was so plentiful as at this show.

Henry Paulman, of H. Paulman & Co., showing the Pierce-Arrow, says it was far and away the best show Chicago ever held and was a success in every respect. His company sold from the floor of the Coliseum every car that it had in its exhibit and two besides from the Michigan boulevard sales floor, all for immediate delivery.

These expressions of approval might be repeated by quoting every Chicago dealer who had an exhibit at the show, but the foregoing are sufficient to prove the statement that the 1919 show was the greatest business show ever held in Chicago.

#### TO CONSIDER TRUCK PROBLEMS

New York, Feb. 3—Men of high standing in the industry will address the motor truck manufacturers' convention to be held here by the N. A. C. C. Feb. 11. Windsor T. White is chairman of the committee in charge. The tentative program includes talks by C. A. Wales, Locomobile truck sales manager; George M. Graham, Pierce-Arrow general sales manager; Col. Fred Glover, Q. M. C.; David C. Fenner, International Motor Co.; James I. Blakeslee, fourth assistant postmaster general; David Beecroft, directing editor Class Journal Co., and E. J. Herbig, sales manager Service Motor Truck Co.

#### SOMETHING NEW UNDER SUN

New York, Feb. 1—The Thermoid Rubber Co. held a meeting of its branch men from Philadelphia, Boston and New York Jan. 29 and got off a new idea in the way of meetings of the kind. General conditions were discussed and some new propositions were placed in the hands of the men. That evening a dinner was held at the New York Athletic Club. This is where the new idea comes in. For the menu Thermoid used an expense report blank with the courses

listed under "Miscellaneous Expense" and including New York Branch cocktail, Boston Branch oyster, Philadelphia Branch soup, F. O. B. cigars, Q. D. cigarets, etc. The route blank was filled in to coincide with the meeting time and place, and each guest was advised to send expense check to "Hold! Do not need it."

#### DISTRIBUTER MOVES UP

Chicago, Feb. 3—H. B. Hall, president and general manager of the Chicago Bethlehem Sales Co., distributor of Bethlehem trucks in Chicago territory, has been appointed president of the Bethlehem Motors Export Corp., New York, formed to market the truck in foreign countries. Before coming to Chicago Mr. Hall was assistant general sales manager at the factory. Ezra C. Bull, formerly vice-president of the Hudson Motor Car Co. of New York and until recently president of the Controllite Lenz Co., succeeds him in Chicago.

#### WALKER IS OLDFIELD S. M.

Chicago, Feb. 3—Paul R. Walker has been made sales manager for the Oldfield Tire Co., Cleveland, O. Mr. Walker for several years has been in charge of the accessory department of the Firestone Tire & Rubber Co., Akron, Ohio, and in that position gained an extensive acquaintance among the jobbers of the country which will be valuable to him in his new position.

#### PIKE'S PEAK MEETING CALLED

St. Joseph, Mo., Feb. 1—The sixth annual meeting of the Pike's Peak Ocean-to-Ocean Highway Association will be held here Feb. 11-12. The meeting place will be in the offices of the Commerce Club of St. Joseph.

#### TEXAS IMPLEMENT DEALERS

Dallas, Tex., Jan. 31—The sixteenth annual meeting of the Texas Hardware & Implement Dealers' Association was held here three days this week. After the war problems and getting back to pre-war times were the principal topics of discussion. The

attendance was the largest in the history of the association and optimism was the keynote of the meeting.

The dealers discussed the motor car and the tractor business. They reported that in many smaller towns of the state hardware dealers are beginning to deal in cars, trucks and tractors. It was argued, in an open discussion of these questions, that the hardware dealer is the proper man to handle these lines of business in the smaller towns which do not justify car agencies. Practically all the dealers reported they are now carrying parts, tires, etc.

Officers elected are: W. A. Clampitt, Kingsville, president; Oscar J. Rhea, Clifton, first vice-president; J. A. Johnson, Estelline, second vice-president; M. T. Cox, Dallas, secretary.

#### NO INTER-STATES AT ONCE

Muncie, Ind., Feb. 1—The Inter-State Motor Co. is notifying its distributors and dealers that under the circumstances they should not depend on deliveries for several months yet. During the war the company took on Government contracts for artillery tractors and had just tooled up ready for production when the armistice was signed. While they will complete only from 15 to 20 per cent of the order now, it will require some time to re-convert the plant back to cars. Meanwhile the engineering and experimental department will modify and improve the model T chassis, so when the Government work is finished Inter-State believes it will have one of the most modern and up-to-date four-cylinder cars on the market.

#### WILCOX BACK WITH COMMERCE

Detroit, Feb. 3—Maj. George D. Wilcox, formerly in command of the Detroit district of the Motor Transport Section of the Quartermaster Department, has returned to the Commerce Motor Car Co., where he will be director of sales and advertising. Major Wilcox formerly was sales manager of Commerce.



Annual dinner of Class Journal Co., held at the Chicago Athletic Association during the Chicago show

Photo by Kaufmann & Fabry Co.





Looking north in the Coliseum during Chicago truck show, Feb. 3-6

## Truck Show Promises Success Also

### Commercial Car Holds Center of Stage at Chicago

**T**RULY representative of the motor truck industry is the motor truck show which followed the passenger car show at the Coliseum to-day. In many respects it is a more brilliant show than the one which preceded it, because the vivid colors and the more open spaces permit of grouping and effectiveness in the displays not possible with the motor cars. The Coliseum and Annex are completely filled, with a very comfortable overflow into the Armory. The last-named will not be the least popular with the visiting public because here is staged the display of the Great Lakes Naval Training Station with its hydroplane and the aircraft engines which all have been hearing so much about but which very few ever have seen. Being the first truck show in many years, the last having been held here in 1912, it is expected the present show will arouse great interest and attract great crowds.

#### Number of Exhibits

In all there are sixty-two complete motor trucks and seventy-nine motor truck chassis on display, exhibited by sixty concerns. In addition there is a fire truck, a chemical truck, a hose cart, eleven trailers, three tractors and trailers, a commercial car body exhibit and a hearse. There is one

steam truck, the Winslow, brand new and shown for the first time, two electric trucks and one electric chassis.

The display includes chassis of appropriate sizes and bodies of appropriate design for almost every conceivable use to which a motor truck can be put. While motor trucks for commercial and industrial purposes predominate, there is as well a strong representation of motor trucks specially designed for general contracting and construction work. It is somewhat remarkable perhaps that there are more chassis with the stub seats and cabs than there are motor trucks complete with bodies, but after all this very fact lends interest to the show for the reason that the construction of a motor truck is more fully revealed when it is displayed in chassis form than when it is shown complete, and the prospective purchaser is far more likely to be interested in the construction of his truck than in the form of the body he ultimately will use.

In a sense the whole show is new. During the last seven years the motor truck industry has made enormous strides. Not a model, and hardly a feature in the show dates back to the last Chicago show, so that for whomsoever has not kept pace with motor truck development every exhibit is

a novelty. But in the most restricted sense of new there is a lot which never has been shown before. There are new models, new makes, new bodies, new features that are being shown to the public for the first time, and this invests the show with an interest greater than usually attaches to such events.

In addition there are the motor trucks being shown by concerns which heretofore have devoted their production exclusively to motor cars but who now find themselves with factory buildings and mechanical equipment left over from war work which are being devoted in part at least to the production of motor trucks. And just because the names of these concerns are more familiar to the general public than are those of the regular truck manufacturers, these newcomers into the truck field will receive a disproportionate share of attention.

#### Variety Is There

The variety, too, inseparable from a motor truck show adds to its attractiveness. No matter what one's interest may be in motor cars there is bound to be a certain amount of sameness in a motor car show. One touring car, for instance, looks very much like another as far as external ap-



pearance and general features go, and individual preference is more likely to be manifested in the relative price than in any other way. The casual visitor will be most interested in those cars which are within the reach of his pocketbook. Upon the contrary, with a motor truck show, it is the utility of the particular motor truck or design, or its fitness for the observer's particular business needs, which attracts and holds interest, and price is not so important a consideration.

The contractor will be interested in tractors and trailers and in dump bodies, the small merchant in the types of delivery trucks, the transportation man in the big trucks with stake bodies, the storage man in the motor vans, the soft drink man in the motor trucks which have bodies especially designed to meet the needs of his business and so on. Utility is the dominant note of a motor car show, and specialization of design and equipment are all-important. All this makes for variety and widespread interest.

#### Advance in Design

Added interest is given the show this year because it is generally understood that under the stimulus of war conditions and emergency needs greater progress has been made in motor truck design and construction during the last two years than probably would have been accomplished in ten years of normal times. The achievements accomplished by motor trucks abroad and at home, in war and in peace pursuits, have been told about until everybody has become more or less interested in them and in what they can do. This universal interest doubtless will be reflected in the attendance expected at the show this week.

There are ten companies which have either been organized or have gone into the motor truck business during the last year showing new models. These ten companies are:

Winslow Boiler & Engineering Co. . . . . Chicago  
Mutual Truck Co. . . . . Sullivan, Ind.  
Paige-Detroit Motor Car Co. . . . . Detroit  
All-American Truck Co. . . . . Chicago  
Dearborn Truck Co. . . . . Chicago  
Hebb Motors Co. . . . . Lincoln, Neb.

Tower Motor Truck Co. . . . . Greenville, Mich.  
Tractor Motor Truck Co. . . . .

Mount Pleasant, Mich.  
Panhard Motors Co. . . . . Grand Haven, Mich.  
Nelson Motor Truck Co. . . . . Saginaw, Mich.

In addition to the above eight companies are showing new models for the first time. These are:

Acme Motor Truck Co., Cadillac, Mich., 5-ton.

Master Trucks, Inc., Chicago, 5-ton.

Commerce Motor Car Co., Detroit, 1½-ton.

Signal Motor Truck Co., Detroit, 5-ton.

Dorris Motor Car Co., St. Louis, Mo., 3½-ton.

Iron City Motors Co., Chicago, 3½-ton.

Available Truck Co., Chicago, 2 and 3½-ton.

Fulton Motor Truck Co., Farmingdale, L. I., new tractor.

The exhibit of the Great Lakes Naval Training Station no doubt will attract much attention and draw many visitors who otherwise might not come. It has been placed in the central section of the Armory and includes war relics and exhibits of one kind and another. Among the features will be a demonstration of aerial telephony. The giant seaplane shown carries machine guns, a six-pounder and drops a depth charge. Bluejackets from the station will explain how machine guns fire through a revolving airplane propeller, how the depth bombs are dropped and so on. Thirty will be on duty, and a naval band will furnish music. The naval exhibit was lent to the show by Lieut. Commander Hugh Allen, who is in charge of the mechanics' schools at Great Lakes.

#### DETROIT ALL SET

Detroit, Jan. 31—The eighteenth annual show to open here March 1 will be featured by a greater exhibit of passenger cars and trucks than ever before. The number of accessory booths will be less. The show will be held in the Crosstown Garage, but the demand for car and truck space was so great that many exhibitors were unable to get into the building. The show is laid out

in a systematic manner and it will be more convenient than ever before, as separate divisions have been arranged for cars, trucks and accessories.

The passenger cars head the list with forty-two makes scheduled, while the trucks come second with thirty-two. Accessory exhibits number eighteen. Three tractors will be shown and one airplane.

While the tractor exhibit consists of but three makes, Cleveland, R. & P. and Fordson, it will be the first time a distinctive tractor exhibit has been made in a D. A. D. A. show. Henry Ford & Son are planning a comprehensive display.

#### PHILADELPHIA GETS BUILDING

Philadelphia, Pa., Jan. 31—The Philadelphia Automobile Trade Association finally has obtained the use of the Commercial Museum for the show which will be held early in March. The Government has been using the building and there had been much uncertainty about obtaining it for the show. The Motor Truck Association of Philadelphia will hold its show immediately after the car show, using the same decorations.

#### TO EXHIBIT CUTAWAY TRACTORS

Detroit, Jan. 31—Cutaway tractors will be a feature of shows for the first time this year. Henry Ford & Son, through its Chicago distributor, will have a machine at the truck show and the Cleveland Tractor Co. will exhibit a similar cutaway machine at the Kansas City tractor show. Other tractor manufacturers probably will have similar displays, it is understood. A cutaway Fordson also will be seen at the Detroit show.

#### TOLEDO SHOW GREAT SUCCESS

Toledo, Ohio, Feb. 3—Toledo's first after-the-war motor show, which closed Saturday, was the most successful exhibit, with the possible exception of 1917. It is estimated that 100,000 persons visited the show, including 3000 out-of-town dealers, and that hundreds of sales were closed as the result of the exhibit.



An exhibit from the Naval training station occupies the center of the Armory at Chicago this week



# Milwaukee Joins Buyer and Trade

## Exhibition Reconstructs Wisconsin Dealers—Record Attendance of 82,000 Visitors

MILWAUKEE, Wis., Feb. 1.—The thorough reconstruction of the Wisconsin dealer trade, skeletonized by the demands of the war machine, and the general reestablishment of active relations between the industry and the public were the two principal aims and purposes accomplished by the twelfth annual Milwaukee show, held in the Auditorium Jan. 24-30 by the Milwaukee Automobile Dealers' Association. In every way imaginable the 1919 show was not only far superior to any previous similar effort of Milwaukee dealers, but it stands out as one of the very best expositions that has ever been held. It attracted an attendance of more than 82,000 persons, a new record for Milwaukee, and especially notable because of the extraordinary circumstances of an immediate post-war period under which it was conducted.

The Milwaukee show always has been the most prominent link between Wisconsin distributors and dealers and between Milwaukee dealers and prospective buyers. While it served this year to be even of greater value as a retail sales promotion plan than in any past year, its effectiveness in a purely trade way was extraordinary. Without detracting in the least from the effort to interest the public in the passenger car and truck, it was an especially powerful and potent factor in bringing the manufacturers and the dealers of Wisconsin together.

### Salesroom and Home Linked

The close of the show not only found the factory and the salesroom going forth hand-in-hand on the way to the greatest and most prosperous year in the history of Wisconsin, but likewise the salesroom and the home has been linked together in a manner that makes it not the least extravagant to say that the motor car factories of the United States doubtless will not be able to make enough cars this year to allot Wisconsin a sufficient number to cover all requirements.

It is conservatively estimated that 600 Wisconsin dealers and fifty from points in the Upper Peninsula of Michigan attended the show during the seven days. Included in the number were many men who were dealers before the war but went into the service and are now establishing dealer and garage business anew. The show was of particular value in giving such men an opportunity to get together with a distributor and close up for territory after doing a little shopping to line up propositions that appeared best suited.

By reason of war conditions, notably the decline in passenger car production, others besides the men who were called to the colors found themselves more or less at sea about the future, especially in respect to dealerships. Many of these men took advantage of the opportunity afforded by the Milwaukee show to get squared away for the new year's business.

In former years, at show time, the dealer

organization of the state was well under way, as contracts usually were made in July, August or September. The show then served interior dealers as a place to bring prospects and to talk over with distributors the problems encountered since contract time. This year it seems that show week was contract time. While distributors began work immediately after the signing of the armistice to rebuild their dealer organizations, many dealers held off until this week in the matter of signing up, desiring to await developments.

Almost every member of the Milwaukee Automobile Dealers' Association is a distributor whose territory consists of Wisconsin and Upper Michigan. As a rule, each distributor is the retail dealer of his car or cars in Milwaukee city and county. Thus, while his exhibit at the show served to attract prospective buyers in his retail territory, it likewise served to attract dealers and prospective dealers in his distributing jurisdiction. Therefore the show was a double-barreled affair, with both triggers pulled at once. Judging from the splendid results of the show, the aim was perfect on both barrels.

Estimates made by leading men of the Wisconsin trade are that this state will need about 60,000 cars to fill 1919 requirements. While this figure looks rather large, it is pointed out that the number of cars actually supplied during 1917 fell far short of needs, despite the handicaps of war-time conditions, such as war taxes, ad-

vanced prices and a natural disinclination on the part of some people to buy cars while the war was raging and the Government made an insistent plea for strictest economy. The license figures of this state for 1918 show that 32,000 cars were purchased, against 48,900 in 1917. Under normal conditions, it is said, the 1918 absorption would have been at least 50,000 or more, and therefore it is not expecting too much to see an increase of 60,000 in 1919, since the industry is practically back on a pre-war basis, or will be there within a short time. Dealers at the show did not talk about the least number of cars they would have to contract for; all they seemed to think of was, how many cars can we get?

The spirit of prospective purchasers who visited the show was similarly optimistic and encouraging. Their attitude was more earnest and understanding than usual at such times. The questions they asked were sound and healthy, not frivolous or flighty. People wanted to know what the dealer was offering and when he could promise delivery; what the price would be "laid down" at the front door of the home; if he or she would be guaranteed against price reduction, or given the benefit of such if it happened and so on. There seemed to be fewer sightseers this year than in past years. The majority of visitors appeared to be prospective buyers ready to sign.

The M. A. D. A. paid much attention to the dealers this year by arranging for deal-

(Concluded on page 29)



Milwaukee had a good-looking show also, as this view indicates



# After-War Motors for Commerce

Airplanes to Be Made Safer for Everyday Travel—More Steam Cars Are Expected



MR. MERRICK WHO  
DEFENDED CHICAGO



COL. BAKER EXPLAINED WHY THE  
ARMY NEVER BOUGHT ANY CARS  
OR TRUCKS.



PEAKE WAS A GOOD  
TOASTMASTER BUT LIKE  
ALL WESTERNERS WAS A  
HOME TOWN BOOSTER.



THE TOASTMASTER  
DREAMING OF KANSAS  
CITY AND THE  
PASSING OF THE  
MISSOURI MALE



FROM HIS FOREHEAD ONE MIGHT  
THINK KETTERING WAS A LOW-BROW  
BUT ON BOY! WHEN HE BEGINS  
TO TALK!



THOUGH THE FIRST  
FEATHERWEIGHT SPEAKER  
HE CLAIMS HE  
WILL BE STOUT  
HAR! HAR!



HORNING DOESN'T LOOK LIKE  
AN ENGINEER. WE ONLY SKETCHED  
HIM BECAUSE HE HAD SUCH A  
FUNNY FACE

CHICAGO, Jan. 31—Four hundred representatives of the automotive industry considered their activities for the reconstruction period at the Home-Coming Supper and afternoon technical session of the Society of Automotive Engineers at the Hotel Morrison yesterday. 'While most engineers realize the pace throughout the automotive world will be much faster in the coming years, there is a feeling of optimism that whatever conditions prevail the engineers of the country will shape the destinies of their respective industries in the same satisfactory manner as was done throughout the war period. As President C. F. Kettering stated, as a result of war work we have on hand a tremendous

amount of technical information, all or some of which undoubtedly will be used by engineers and designers in the motor car, truck, tractor and airplane field.

Besides President Kettering the speakers of the evening included George W. Smith, assistant chief engineer of the Nash Motors Co. and chairman of the Midwest Section of the S. A. E.; H. H. Merrick, president of the Chicago Association of Commerce; Col. Chauncey Baker, Quartermaster Department, Motor Transport Section, and William B. Stout, United Aircraft Engineering Corp. E. E. Peake, executive secretary of the National Automobile Dealers' Association, acted as toastmaster. The afternoon session was given almost

entirely to technical papers, and Capt. Mark Smith, U. S. M. C., told of his experiences at Chateau Thierry.

Although the addresses following the dinner were full of generalities, some specific facts were driven home by all the speakers. Mr. Kettering suggested that the wealth of technical information be card-indexed in every engineering office, for progress will be so rapid that the engineer who is not alert to opportunity may let it pass him and then vainly attempt to catch up to it. Besides outlining briefly what the engineers of this country had before and during the war, Mr. Kettering pointed out some of the remarkable developments that to him seemed the crowning achievements of the country's technical skill. He mentioned the wonderful feats of wireless telephony, whereby one or more airplanes could communicate with each other or any station on the ground. This, he said, is of untold benefit when flying above the clouds, as it gives the pilot his exact location. A chain of these stations on the earth's surface extending across the country would constitute guiding means for the great air lanes that are sure to come.

## Self-Guiding Airplanes

Mr. Kettering predicted that the time would come when airplanes would be self-guiding, that is, the pilot could go to sleep in his plane if he so desired and be assured that his machine would not miss the point of destination by more than a fraction of a mile. He said this has been done successfully in flights in and about Dayton, Ohio. In one case the plane flew from Dayton to Columbus, Ohio, without anyone touching the control levers and the machine came within half a mile from its goal.

While it is true that much valuable information has been gained along aviation lines with the machines developed during the war, such information has still to be supplemented greatly if it is to be of value in commercial life. War machines are no more capable of performing the functions of a commercial airplane than the tank is for agricultural use. In designing war planes the factor of safety comes last. Everything is done to get utmost efficiency in handling and speed. In fact, speed is the desirable thing in airplane work, whether commercial or for war work, for it is speed that makes the plane economical to use. Mr. Kettering illustrated this point by stating that the distance between Dayton and Columbus is nominally made by train in about 3 hr., while by airplane this is done in something like ½ hr.

On behalf of the Chicago Association of Commerce, Mr. Merrick welcomed the engineers to Chicago and expressed the thanks he said every individual, in fact, the whole nation owed the engineers of the country in helping to carry the war to successful conclusion. He especially commended the performance of the dollar-a-year men and



those who collectively gave their best talents in evolving automotive products that the nation might be assured of its highest talents. In closing, Mr. Merrick expressed hope that the thousands of skilled men still abroad would soon be back in America to pour their additional knowledge into the engineering realm.

Colonel Baker told the engineers of the great work the motor truck had done in crowding out the army mule. He outlined the introduction of the motor car into the army in 1903 at one of the national encampments and that of the truck in 1907. Since those years, Colonel Baker said, the motor vehicles have played such important parts in army work that they are to-day indispensable. He showed how the trucks had been able to go through Mexican country where roads were totally absent. He made special mention of the standardization of army trucks. In the early days of mule wagons, he said, there was no such thing as standardization, so it became necessary to carry a multitude of parts for different-sized vehicles, and often these did not fit. With the standardized army truck we are assured that springs, for instance, of one truck will fit any other truck, though thousands of miles away.

"We are now at the zero hour," said Mr. Stout, speaking of the possibilities of the airplane for commercial uses. He pointed out that many people now that the war is ended are of the opinion that aircraft development will lose much of its momentum gained in the last year or two. To offset this, Mr. Stout stated, the aircraft producers are simply preparing for a new attack—a commercial attack. Like Mr. Kettering, Mr. Stout said that the war machine must be modified greatly to meet the demands for a successful commercial plane. He dwelt particularly on the point that travel by airplane would be safer, if indeed it is not already safer, than any mode of land travel.

We think nothing, he said, of trusting our lives to the thousand and one things

necessary to carry a train at 60 m.p.h. Such travel is dependent upon many things. There are the engineers, firemen, towermen, switchmen, etc., the rails, ties, rail connectors and hundreds of other things, the failure of any one of which spells disaster to a rapidly moving train. The slightest deviation of a train from its course often results in loss of many lives. In airplane handling we have no such conditions. There are no signals to watch and the successful handling of the machine in the air depends entirely on one man, and even this we soon may see done automatically in the future, it was said.

There are two important factors in making the airplane safe as a commercial proposition. The two possible sources of danger, that is, the two likely to mean disaster, are structural breakage and fire. These, however, have been greatly reduced in machines of to-day, chiefly by careful design. In fact, structural breakdowns are rare nowadays, and the fire menace has been overcome by placing the fuel tanks, exhaust pipes and line connections in such a way that leakage of fuel does not carry with it the element of danger as formerly.

#### High Speeds Safer

Strange as it may sound to the layman, high speeds are safer in aviation work than slower speeds, according to Mr. Stout. This is so because it takes care of air turbulence and air pockets and the machine is handled more easily. The element of danger always is present in high landing speeds, and as low landing speeds are not generally found in machines capable of great flying speeds, this remains a problem for engineers to work out. A fast plane with low landing speed is the logical thing for commercial work, Mr. Stout said. Slow landing speed generally means that the plane must come down at a comparatively flat angle to the ground, which means the plane probably will roll quite a distance. The three landing problems to be worked out take in slow landing, landing in a small space and landing on rough ground.

In closing his talk, Mr. Stout pictured Grant Park in Chicago as a great air harbor, laying particular stress upon its strategic location. He concluded his talk by outlining briefly the possibilities of establishing commercial air routes, showing that such means of transportation would not be hampered by conditions prevalent on land, such as track maintenance and similar things.

The technical session was presided over by George W. Smith, Midwest Section chairman. The shortness of the interval between the afternoon and evening sessions did not permit of much discussion on the various papers presented. After a brief business session A. F. Milbrath, secretary-engineer of the Wisconsin Motor Mfg. Co., read his paper on "Standard Army Truck Engines for Commercial Use." One of the features of these engines is the elimination of aluminum supports on the crankcase, these being now of steel. A cast-steel, or malleable, arm is bolted on the rear of the bell housing, and a large trunion bearing on the iron gearcover carries the front end. This allows a three-point suspension. The incoming fuel is supplied with heat by casting the intake and exhaust manifolds integral. A new feature on these Wisconsin engines is a system of returning the oil from the front of the engine to the sump on down-grade conditions, thus preventing the front cylinders from pumping oil.

Asked whether or not this engine was suitable for tractor use, Mr. Milbrath replied it was primarily a truck job, owing to the inclosed-flywheel construction, but that it could with modifications be used in tractors.

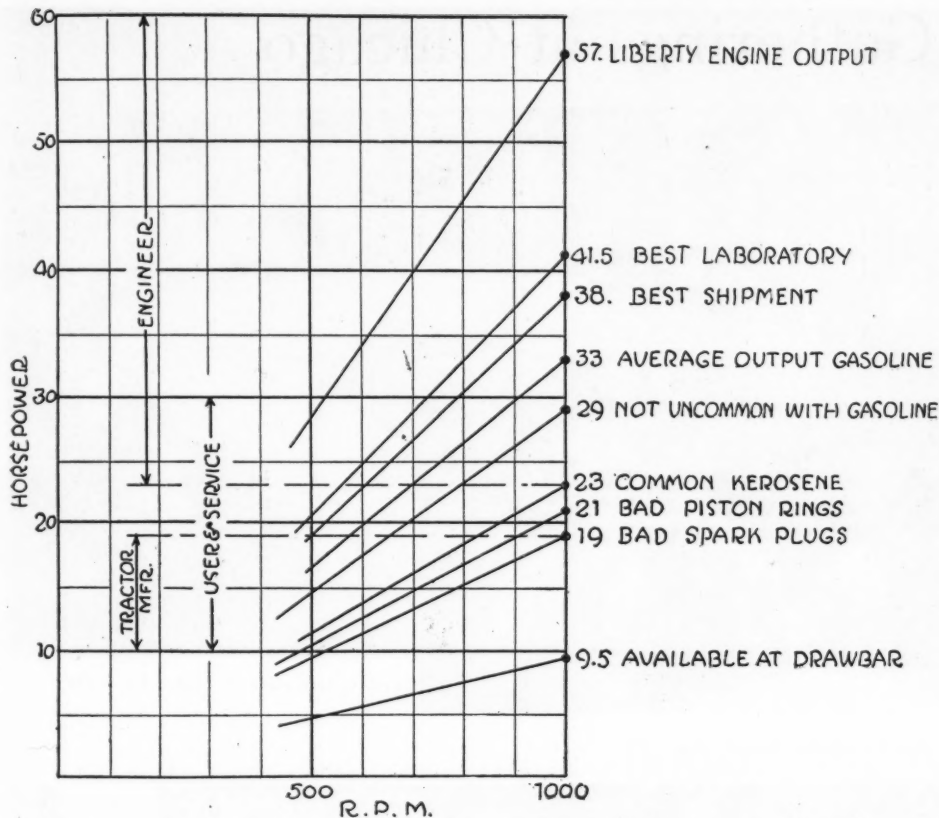
H. L. Horning, president of the Waukesha Motors Co., spoke on engine performance with certain fuels. He had not prepared a paper but illustrated his talk by blackboard drawings. Mr. Horning pointed out by curves the performance of a 330-cu. in. engine under various conditions at from 500 to 1000 r.p.m. The Liberty engine output was taken to start with and compared



A technical session preceded this Home-Coming supper of the Society of Automotive Engineers

Photo by Kaufmann & Fabry Co.





Curves used to illustrate H. L. Horning talk and showing performance of 330-cu. in. engine under various conditions at 500 to 1,000 r. p. m.

with this were the outputs of the same sizes of tractor engines. The best laboratory tests engineers reasonably might expect, as shown by the chart, is 41.5 per cent, while with kerosene the best the engineer hopes for is about 23 per cent. The fluctuations in output, owing to leaky rings, bad plugs and other causes, may cause it to drop as low as 9.5 per cent under certain operating conditions, Mr. Horning said. This figure, however, was not to be taken as an axiom.

The tractor of the future, according to Mr. Horning, likely will be fitted with some sort of regulating device whereby the operator simply by turning a lever to a given position can burn any sort of fuel, whether gasoline, kerosene or distillate. He also exploded the heavy-fuel knock theory, stating that his experiments have shown that the so-called pre-ignition knock was not due to pre-ignition but rather to the terrific increase in pressure. This knock occurs, according to his observations, about 20 deg. after top dead center. The pressure rises up to from 900 to as high as 1300 lb. a square inch. The resultant heat, however, dissipates very quickly.

#### Redesign Cylinders

Mr. Horning summed up the results of his findings by stating that if we are to burn kerosene successfully in the Otto cycle gas engine, the combustion chambers must be redesigned to hold back the explosion pressures.

Mr. Kettering supplemented the talk by Mr. Horning by stating that the so-called carbon knock was not due to the carbon but rather to the high temperatures and pressure set up by the presence of carbon. In other words, he expelled the idea of the carbon particles remaining in an incan-

descent form and firing the charge prematurely. Carbon, Mr. Kettering pointed out, makes one of the finest insulating materials in the world, and by thus insulating the waterjackets heat cannot be dissipated to the cooling water fast enough and the heat builds up, together with the pressures, in the explosion chambers.

At this point in the afternoon meeting E. B. Blakely, who for the last four years has been expounding the Hvid type of engine, suggested that engineers give this type of engine more thought, as it does away with all ideas of individual engine makers having to design their engines for certain types of fuels. The Hvid engine, Mr. Blakely stated, carries what might be called a little still of its own, so that no matter what the fuel in question is, the Hvid engine can handle it, as it automatically adjusts the fuel to the engine.

The paper by J. D. Nies of the Lewis Institute of Technology on "Possibilities of Steam Power," brought forth much favorable comment. While the instantaneous generation of steam never will be realized, Mr. Nies stated that in the steam cars of to-day the time required to get up steam is very short. The leading difficulties of the early forms of steamers have been overcome, such as scale formation in the boiler, frequent filling of the water tank, etc. He suggested that more attention be paid to the subject of freezing, so that minor damage as a result would be eliminated. In view of the use of present-day heavy fuels, which the steamer is quite capable of coping with successfully, Mr. Nies believes a considerable extension of the steam car may be looked for in the next few years. He further suggested that steam cars should be so built that the water could be drained from one point. Some day, he said,

we may reasonably expect the steam car owner simply to press a button and find steam up by the time he gets out to the garage. The growing appreciation of the uselessness of high speeds on the roads has tended for smaller boilers in the steam cars, since these have had no bad effects upon the general car performance,

#### MILWAUKEE HOLDS SHOWS

(Concluded from page 26)

ers' meetings on the afternoons of Wednesday and Thursday, at which some of the big men in the industry appeared. On Wednesday the big gun was E. LeRoy Pelletier, advertising manager of Reo, who talked on publicity promotion. He also predicted that motor car values would not undergo a decline for a long time to come. He urged dealers to use large space and above all to use plain, every-day English, and plenty of it.

"Put a lot of facts in your advertising, and put them into language that everyone will understand," he said. Referring to prices, he said his favorite answer to the question, "When will the price of cars go down," is "About the time when wheat gets back to 90 cents a bushel."

Thursday afternoon Charles W. Nash, head of the Nash Motors Co., Kenosha, Wis., and C. A. Brownell, of the Ford Motor Co., were the principal speakers. Their remarks were devoted to merchandising ideas and suggestions as to dealing with questions which the public is asking about the industry and its future.

The sales sessions under the association auspices were supplemented by a generous number of round-table gatherings held by Milwaukee distributors for their dealer organizations during show week. Such meetings were held every day at noon or night. One of the largest of these meetings was that of the Nash Sales Co., Milwaukee, for Wisconsin and Northern Michigan dealers, nearly 200 of whom were present. Other distributors who gave dinners for their dealers were the Overland Wisconsin Co., Milwaukee Buick branch, Flint Motor Car Co., Oldsmobile, Milwaukee branch Ford Motor Co., Osmond Motor Car Co., Winton and Paige, March Motors Co., Mitchell and others. Friday the Overland-Wisconsin Co. took a party of its dealers to Chicago to see the new Overland.

After the doors of the Milwaukee show closed Thursday night, visiting dealers joined Milwaukee dealers, salesmen and other members of the trade in witnessing a midnight vaudeville performance at the Palace theater as the guests of the M. A. D. A. There were approximately 1000 in the audience.

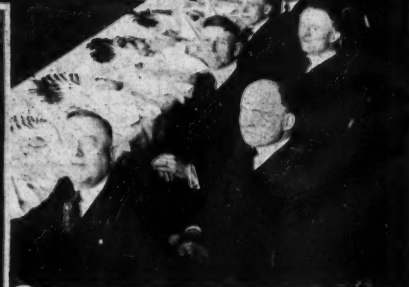
#### Cloverland Dealers

During show week Upper Michigan dealers got together and formed the Cloverland Automotive Dealers' Association. An organization committee was named, consisting of Edward E. Werner, Chassell, Mich., chairman; E. C. Watson, president Cloverland Auto Co., Marquette, Mich.; and John C. Knutson, Escanaba, Mich. A second meeting to perfect the organization and elect officers will be held about the middle of February at a central point in the Upper Peninsula, to be selected by the committee.



# Dealer Gatherings at Chicago

*Held  
During  
Show Week*

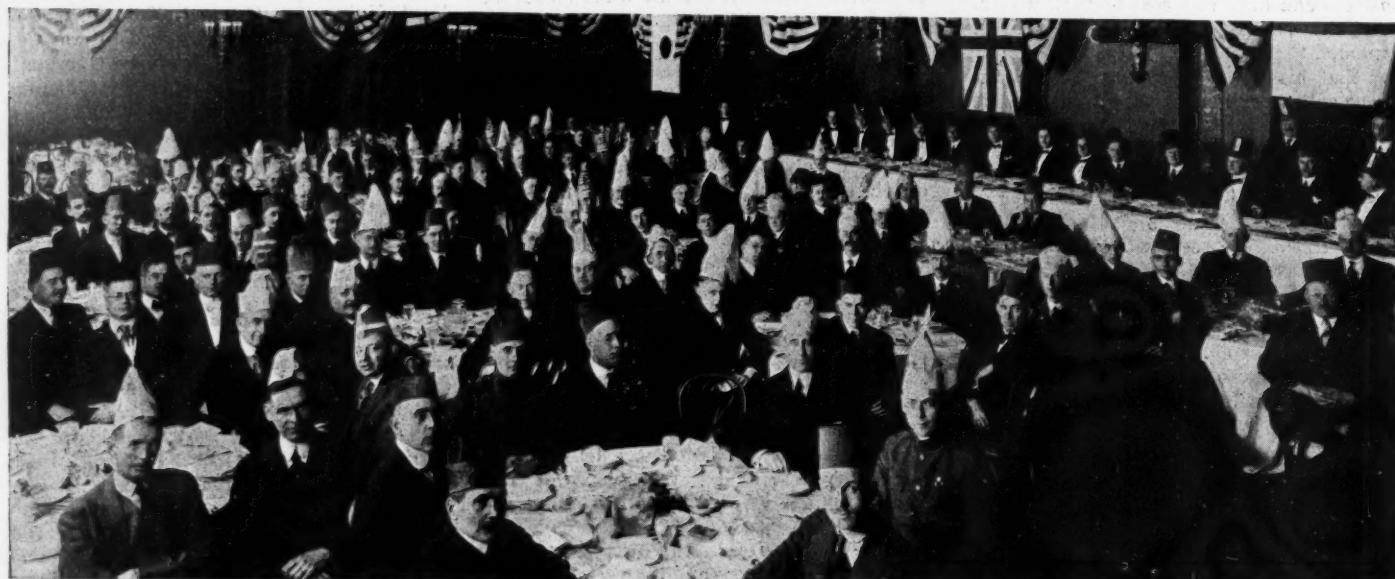


Jordan banquet at Hotel La Salle

Elgin dealers' luncheon at the Congress hotel, Jan. 29



Maxwell men held their convention at the Congress, Jan. 30



Scene when Paige dealers held their banquet at Congress hotel, Jan. 30.—Photos by Kaufmann & Fabry Co.





Nash held its banquet at the Hotel Sherman during the Chicago show

## *M. A. M. A. Holds Annual Meeting in Chicago*



—Photos by Kaufmann & Fabry Co.

About 400 members of the Motor & Accessories Manufacturers' Association at the Congress

CHICAGO, Feb. 1—Charles E. Thompson, president of the Steel Products Co., Cleveland, Ohio, was elected president of the Motor & Accessory Manufacturers' Association at a meeting of the board of directors Thursday afternoon. He succeeds C. W. Stiger, Chicago, president of the Stromberg Motor Devices Co. The directors chosen the previous afternoon were E. P. Hammond, president of the Gemmer Mfg. Co., St. Louis, Mo.; and G. W. Yeoman of the Continental Motors Co., Detroit. Other officers elected are: First vice-president, E. A. Broadwell, vice-president Fisk Rubber Co.; second vice-presi-

dent, Christian Girl, president Standard Parts Co.; third vice-president, W. O. Rutherford, vice-president B. F. Goodrich Co.; treasurer, L. M. Wainwright, president Diamond Chain Co.; secretary and assistant treasurer, T. J. Wetzel, Precision Castings Co.; manager, L. M. Bradley, and assistant manager, L. M. Hemmingway.

### **Address by Stiger**

The afternoon meeting was strictly a business session at which the retiring president delivered an address. Mr. Stiger painted the future very bright for the accessory makers, stating that as the country had passed successfully the war-period

cars would be sold in greater numbers than ever, which meant the parts makers would be in direct line for immense production, as the manufacture and sales of parts is directly proportional to the number of cars built and sold. There was a general feeling of optimism throughout the M. A. M. A. proceedings and the members declared the Chicago convention the most successful in years.

The evening session constituted chiefly the banquet in the Gold room of the Congress Hotel and was attended by about 400 members. The evening was given entirely to a social time, no addresses being made.



# Over the Top in Service and Repairs

Converting War-Day Failures Into  
War-Time Success

Series No. 2

## Article I—Advertising

By T. P. Bowman

IT appears that the greatest asset of the dealer or service shop manager has been overlooked in a great many cases. In fact, it appears that a great many dealers and service shop managers do not really know what their greatest asset is. If the owner of a car agency were asked what his greatest asset is, within all probability he would say it is in the merits of the cars he sells. If the owner of a service shop was asked what his greatest asset is he undoubtedly would say that it is in the quality of service he gives. But hardly ever will either one of the two refer to advertising with its proper significance, if they refer to it at all. In some cases advertising is used properly and in its proper sphere. Where it is so used its results are very evident, but either for the reason that the business is behind the times in advertising or that it is lacking in real proof of its actual worth, advertising has not been considered sufficiently.

### Learning from Makers

If the dealer and the service shop manager would take a lesson from the manufacturer of automotive products, the lesson would be well worth the effort. Every day the value of advertising is brought to the dealers' attention by the manufacturer through the columns of the foremost trade journals devoted to the automotive industry. Through those columns the reader becomes nearly as familiar with this product or that product actually as though he were engaged in the production of it. A sort of familiarity exists between himself and the advertiser through the product which is placed before him on paper. When in need of a certain article the dealer has in mind that very article as it appeared to him in the illustration and explanation of someone's advertisement. If he does not remember exactly who the advertiser is, he most likely remembers where he saw it, and he soon will locate the advertiser through the columns of the trade paper in which the advertisement appeared.

Mr. Dealer, have you ever asked yourself why you immediately refer to your trade paper when you are in need of information as to where the certain thing you want can be obtained. Have you ever asked yourself why you try to find the advertisement of some certain firm you had located in the

trade paper? There is no doubt but what information was wanted in the first place, but merely to locate the name of a manufacturer of the product did not seem to have the effect or make the impression upon you that you desired. You may have found the names of several concerns but could not decide as to which of them you could expect the most from in quality and service. As a matter of fact there is no way of determining from whom the most can be expected except for the impression any one of these concerns could make upon you, and the only manner of attracting your attention and making a favorable impression on the reader is through the concern's publicity.

The value of an advertisement may be likened unto the value of a friend who has immediate access to Mr. Jones' attention and on account of this is able to introduce you to him and procure an interview while hundreds of people ahead of you await the signal and perhaps never get it. You were no more to Mr. Jones than any other of the audience, perhaps not so much, but, through the influence of the friend who, at will, could interview the big fellow, you were presented to him. In this case the friend had merely to present you. You were the article and had to make the impression upon Mr. Jones, which you desired to make and which you had the opportunity of making because you were in his presence and could speak for yourself.

### When Friend Cannot Intercede

Therefore, the friend, as an advertisement in your behalf did all that could be expected of him under the circumstances. But there are a great many occasions where this friend cannot present you to Mr. Jones merely because you are the friend of the friend of Mr. Jones. You must be of considerable more significance than an acquaintance. You must possess certain attributes which are of particular interest to Mr. Jones, and Mr. Jones must be made to realize it. In this instance, if you are given an audience by Mr. Jones you know that your friend has represented you exactly as you would have represented yourself. You know that Mr. Jones knows practically as much about you as you do

yourself or his interest could not have been obtained. You furthermore know that your friend has brought about the desired result.

There are two kinds of advertising which bring results practically similar to the accomplishments of the friend mentioned. One type, if sufficiently influenced by things other than the nature or composition of the publicity itself, may bring about the desired result but it cannot be depended on. Then there is the other type which on account of its composition and construction never fails to command the attention of the reader. First there is a certain attraction on the surface which, no matter how casual the observation may be, will attract, for some reason or another, the attention.

### No Government Dump

When one's attention has once been obtained the intent of the publicity has been more than half satisfied, but not fully, because the interest of the reader is to be obtained. This comes under composition and construction. The composition and construction of the publicity is really the most important factor after having commanded attention, because in this the interest is aroused. Whatever you have to say regarding your article or articles is contained under and within this heading. The manner in which you express yourself in your composition has practically all to do with the final worth of the advertisement. If you have expressed yourself in an appealing and proper manner, you have done all you could have done had you personally called on the subject.

If you have not expressed yourself properly in the composition of your advertisement, you have lost every possible merit which might be expected of it because the attraction created has been to no avail and having created this attraction and not having satisfied the reader in your composition it is very apt to have created criticism. The majority of advertised articles are either approved or condemned. If he has not approved of it as the result of your talk, he has condemned it as the result of it. In other words, you have failed to say what you should have said or you have said what you should have said in a way you should not have said it.



# Serial Numbers of Passenger Cars

## Motor Age Maintenance Data Sheet No. 24

One of a series of weekly pages of information valuable to service man and dealer—Save this page

### MARMON

Year	Model	Cyls	Price	Serial Numbers
1912	32	4	\$2750	112001, 1212001, 312001, 412001, 512001, 612001, 712001, 812001
1913	32	4	3000	2113001, 2313001, 2513001, 2613001, 2813001, 2713001
	48	6	5000	1113001, 1213001, 1313001, 1513001, 1613001, 1813001
1914	41	6	....	114001, 214001, 314001, 514001, 614001, 814001
	48	6	5000	1114001, 1214001, 1314001, 1514001, 1814001
1915	41	6	3250	115001, 215001, 315001, 515001, 615001, 815001
	48	6	5000	1215001, 1615001, 1815001
1916	34	6	2700	1516001, 1716001, 1416001, 1316001, 1816001
	41	6	3250	116001, 216001, 316001, 416001, 616001, 816001
1917	34	6	3100	871001, 717001, 417001, 517001, 817001
1918	34	6	3550	818001, 718001, 418001

Each body type has its own serial number; the first is given in each case. Numbers on heel board of driver's seat and on left side of main frame

### MAXWELL

Year	Model	Cyls	Price	Serial Numbers
1912	18	2	\$625	
	25	4	950	
	30	4	1150	
	36	4	1480	
1913	22	4	785	
	30	4	1145	
1914	40	4	1675	
	25	4	750	
	35	4	1225	1-1400
	50-6	6	1975	
1915	25	4	695	14001-52000
1916	25	4	655	52001-110000
1917	25	4	595	110001-193801
1918	25	4	....	193801 up

Numbers on name plate on right end of front seat base

### McFARLAN

Year	Model	Cyls	Price	Serial Numbers
1912	26	6	\$2100	500-1000
1913	27	6	2590	3000-4000
1914	65	6	2900	4000-6000
1915	77	6	2900	6000-7000
1916	107	6	2900	9000-10000
1917	127	6	3200	10000-11000
1918	127	6	3900-4300	1800 up

### MERCER

Year	Model	Cyls	Price	Serial Numbers
1912	35R	4	\$2500	
	35AB	4	2750	588-990
1913	J & K	4	2700	
	G	4	2900	991-1590
1914	35J	4	2600	
	35HO	4	2900	1591-2098
1915	22-70	4	3000	2099-2549
1916	22-72	4	3000	2550-3299
1917	22-73	4	3500	3300-4099
1918	Series 4	4	3250	4100-4600

Number on dash plate

### METZ

Year	Model	Cyls	Price	Serial Numbers
1912	22	4	\$495	15000-18301
1913	22	4	495	18302-22949
1914	22	4	475	22950-28800

(Also 300 cars numbered from 28801 to 29100 on which equipment determines model)

1915	22	4	495	29101-32949
	25	4	600	33000-36380
1916	25	4	600	36381-40248
1917	25	4	545	40249 up
1918	25	4	695	

### MITCHELL

Year	Model	Cyls	Price	Serial Numbers
1912	30	4	\$950	
	30-5	4	1350	22000-30000
	48	6	1750	
1913	5-4	4	1500	
	5-6	6	1850	30001-39500
	7-6	6	2500	
1914	Four	4	1595	
	Six	6	1895	40501-50000
	Big Six	6	2350	
1915	Four	4	1250	
	Six	6	1585	50000-60000
	Spl. Six	6	1895	

1916	C-3-42	6	....	60001-64999
	C-5-42	6	....	60001-64999
	C-7-42	6	....	60001-64999
	B-2-40	8	....	57001 up
	B-5-48	8	....	57001 up

Serial number of car located on brass plate on heelboard of front seat on right side on engine guard, also on frame side member, left side, front

	D-2-40	6	....	70000 up
	D-5-40	6	....	70000 up
	C-3-42	6	....	65000-69999
	C-5-42	6	....	65000-69999
	C-7-42	6	....	65000-69999

Serial number of car located on plate on right front door post, also on engine casting front timer gearcase and frame side member, left side, front

	C-4-42	6	....	90000 up
	C-5-42	6	....	90000 up
	C-7-42	6	....	90000 up
	C-42	6	....	90000 up

Serial number of car located on plate on left front door post, also on engine casting front timer gearcase and frame side member, left side, front

1918	D-40	6	1465-2250	75000 up
	C-42	6	1735-2850	90000 up

### MOLINE-KNIGHT

Year	Model	Cyls	Price	Serial Numbers
1912	M-12	4	\$1700	2632-2785
1913	M-40	4	1800	2786-3999
1914	MK-50	4	2500	4000-4999
1915	MK-40	4	1475	6000-6499
1916	MK-40	4	1750	6500-7000

except 6888, 6924, 6985, 6986, 6988, 6990, 6992, 6993, 6996 and 6998. These are 1917 model numbers. See below

1916-17	G	4	1840	8000-9000
1917	C	4	1495	9001-10000
1918	G	4	1985	8000-9000
	C	4	1650	9001-10000
	L	4	2280	11000 up

(Also the exceptions listed under 1916)

### MONROE

Year	Model	Cyls	Price	Serial Numbers
1915	2	4	\$495	501 up
1916	4	4	1095	8000 up
1917	3	4	565	4001 up
	6	4	1095	9151 up
1918	M-4	4	995	

### MOON

Year	Model	Cyls	Price	Serial Numbers
1912	4-30	4	....	5000 up
1913	4-40	4	....	6300 up
1914	4-42	4	....	14000 up
	6-50	6	....	41000 up
1915	4-38	4	....	31000 up
	6-40	6	....	61000 up
1916	6-30	6	....	70000 up
	6-44	6	....	62000 up
1917	6-43	6	....	70700 up
	6-66	6	....	66300 up
1918	6-36	6	....	36000 up
	6-45	6	....	71500 up
	6-66	6	....	66800 up

### MOORE

Year	Model	Cyls	Price	Serial Numbers
1916	30	4	\$550	1-200
1917	30	4	550	200-800
1918	30	4	695-995	800-1100

### NASH

Year	Model	Cyls	Price	Serial Numbers
1918	683	6	\$1295	121002 up
	681	6	....	100101 up

### NATIONAL

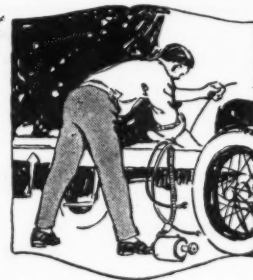
Year	Model	Cyls	Price	Serial Numbers
1912	40-V	4	\$2600	5501-6107
1913	40-V	4	3300	7001-7754
	40-V3	4	....	8101-8418
1914	6-W	6	2375	9001-9600
1915	AA	6	2375	10100-10250
1915-16	AB	6	....	11100-12301
1916	AC	6	1690	14000-15507
	AD	12	1990	16001-16729
1917	AE	6	1750	17001-17285
	AH	12	2150	18000-18150
	AF	6	....	20000 up
	AK	12	....	25000 up
1918	AF	6	....	20001
	AK	12	....	25001





# Electrical Equipment of the Motor Car

*By David Penn-Moreton & Darwin S. Hatch.*



*Editor's Note—Herewith is presented the 132d installment of a weekly series of articles begun in MOTOR AGE, issue of June 29, 1916, designed to give the repairman and motorist the knowledge which will enable them to care for and repair any and all of the electrical features of the car, no matter what make or model it may be.*

*The first half of this series has been published in book form by the U. P. C. Book Co., Inc., 243-249 West Thirty-ninth street, New York, and is sold at \$2.50. The remainder of the series will be published as a supplementary volume.*

## Part CXXXII—Bijur Electrical Systems

THE separate starting motors are all round-frame, four-pole, series-wound. Power is transmitted to the engine by a Bendix drive or a small pinion is made to slide on the square shaft of the starting motor by the operation of the starting pedal or handle which also closes the starting switch. The first position on the starting switch connects a resistance in series with the starting motor and battery, and the motor operates at a slow speed, which assists in the meshing of the driving gears. The resistance is cut out of circuit after the gears are in mesh by a farther movement of the starting switch. This small pinion is disengaged as soon as the starting pedal or handle is released and the starting switch is opened.

In the combined generator and starting motor units, the armature is connected to the engine crankshaft by a chain.

### Bijur on Apperson 4-40 and 6-45

The Bijur installation on the Apperson 4-40 and 6-45 is of the three-unit, 6-volt, two-wire type, Fig. 675. The output of the generator is regulated by the third-brush method, and the generator automatically is connected to and disconnected from the battery by an electromagnetic cutout mounted inside the generator housing. The generator is reversible, and only two wires connect to the generator.

The starting motor is provided with a square shaft, and a pinion is mounted on this shaft. The pinion can be moved horizontally along the shaft. It meshes directly with the teeth

in the edge of the flywheel, and no intermediate gears of any kind are used. The starting handle on the cowl connects through linkage to a trunnion which moves the pinion on the square shaft of the motor. The starting lever also operates the starting switch. The pinion normally is held out of mesh with the gear on the flywheel by a spring which also holds the starting switch in the open position.

The first movement of the starting handle closes a set of contacts on the starting switch, which connects the motor to the storage battery with a resistance coil in series. This resistance coil is inside the starting switch. The starting motor turns over quite slowly when the resistance coil is in circuit and thus enables the pinion on the motor shaft readily to be meshed with the teeth on the flywheel. Farther movement of the starting handle connects the starting motor direct to the storage battery and the motor then will spin the engine.

Ignition is taken care of by a magneto.

A battery charge indicator is located on the cowl board. This indicator stands at "Floating" when the battery is neither charging nor discharging. When the charging current exceeds approximately 2 amperes the indicator swings over to "charge," and when the discharge current exceeds approximately two amperes the indicator swings over to "discharge."

A two-gang switch on the cowl board controls the two head-lamps and the taillamp. The lamp on the cowl board is controlled

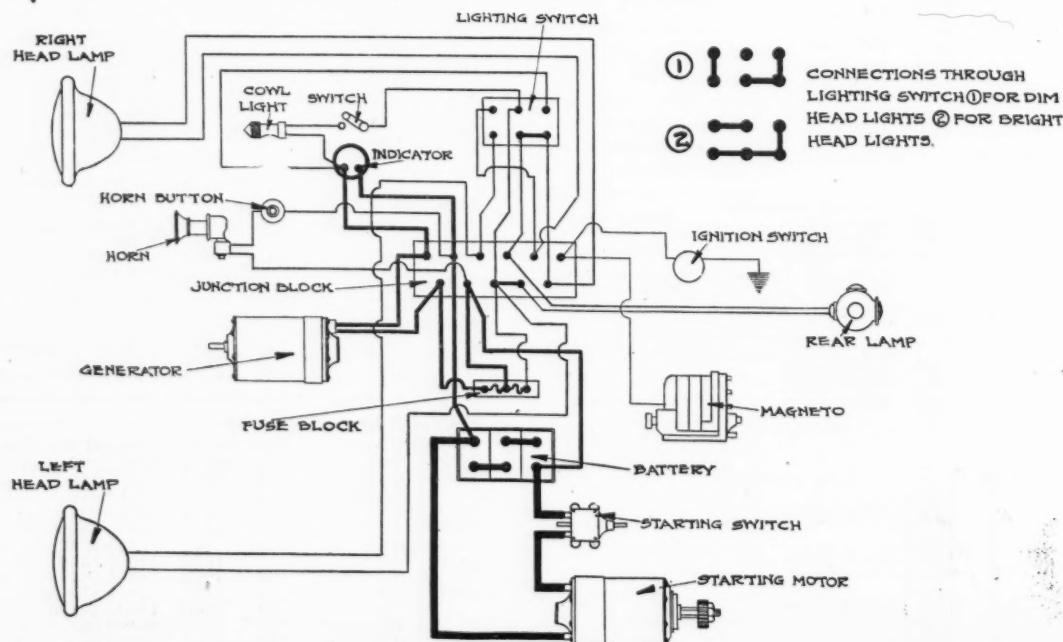


Fig. 675—Wiring diagram of Bijur installation on the Apperson 4-40 and 6-45



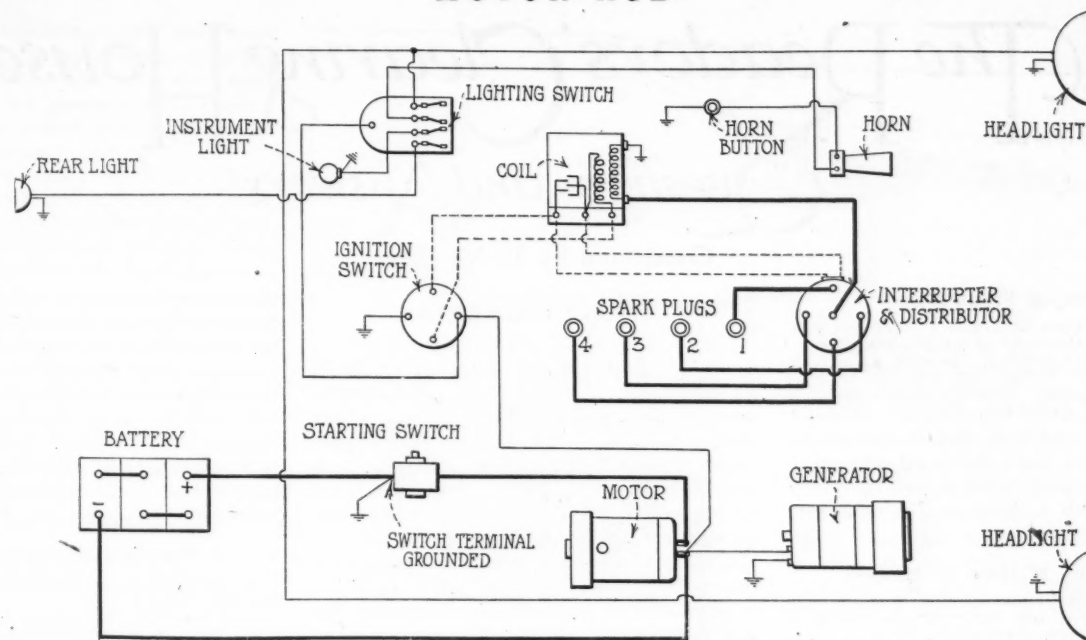


Fig. 676—Wiring diagram of Bijur installation on the Hupmobile N

by a separate switch, or key, at the lamp itself. When the left lighting switch is pulled out the headlamps burn dim, and when both the switches are pulled out the headlights burn bright. The taillight always is lighted regardless of whether the headlights are bright or dim.

A magneto is provided to take care of the ignition, and its operation is controlled by an ignition switch on the dash.

### Bijur on 1916 Hupmobile

A wiring diagram of the Bijur installation on the 1916 Hupmobile is given in Fig. 676. It is a three-unit, 6-volt, single wire system with the negative terminal grounded. The output of the generator is regulated by the third-brush method, and the elec-

tromagnetic cutout is located inside the generator housing. The starting motor is a four-pole series-wound motor, connected directly to the engine by a pinion which slides on the square shaft of the motor and into gear with the gear on the face of the fly-wheel. This pinion is shifted by a yoke, which in turn is operated by the starting pedal, which also acts to close the starting switch.

The lights are controlled by a four-position lighting switch mounted on the cowl board. Four fuses and the resistance for dimming the headlamps are mounted on the forward side of this switch.

An ignition switch on the cowl board controls the ignition, which derives its current from the storage battery or generator. The wiring diagram of the ignition system is shown in Fig. 245.

### ARIZONA CONSIDERS ROAD BONDS

Phoenix, Ariz., Jan. 31—Arizona will expend \$30,000,000 for a highway system, if a bill now pending in the legislature is adopted. The bill provides for an extension of the present limitation of the state debt from \$350,000 to include a \$30,000,000 bond issue for good roads.

The bill as introduced provides for the construction of three highways crossing the state east to west, one following the Santa Fe trail, one via the Roosevelt dam and one across Southern Arizona along the route of the borderland highway. The proposed road via the Roosevelt dam would be a link in the Ocean-to-Ocean highway. A north and south artery from the Grand Canyon to Nogales also is provided.

If adopted, the proposed constitutional amendment will have to be submitted to the people for approval before it becomes effective, and while this might be done at a special election, the regular course would be for it to be placed on the ballot at the general election in 1920.

### HIGHWAY TRANSPORT PLANS

Washington, Jan. 31—Post-war plans for highway development by the Highways Transport Committee are being completed. They include uniform state traffic laws and police traffic regulations, stimulation of food production by food distribution via motor truck, a survey of facilities available for highways transportation and city mar-

keting, transportation facilities for soldier farms including movements to open up large tracts of grounds for settlements, development of transportation facilities for resources other than agricultural, co-operation with railroads and waterways taking in feeder extensions, co-ordination of highways transport with rail and electric line freight or express, standardization of highway shipping methods and the placing of returned soldiers experienced in highways transport.

Campaigns for snow removal in the various states are being undertaken through the regional and district organizations. New Jersey has initiated definite plans for handling snow with each individual county working in its unit capacity. Other states, such as Pennsylvania, New York, Michigan and Ohio, are working in co-operation with the Highways Transport bodies through the highway commission offices. Raymond Beck, field engineer of the committee, is compiling bulletins dealing with the causes of snow drifts, methods of prevention and methods of fighting snow and removing it. These bulletins will be distributed to the various interested agencies.

### TO STAGE ANOTHER TEST

Detroit, Jan. 31—The Packard Motor Car Co. will start a new efficiency test for Packard trucks Feb. 1, for which prize money aggregating \$17,600 has been set aside.

### DELAWARE CONSIDERS NEW LAWS

Wilmington, Del., Jan. 31—Motor legislation is planned at the biennial session of the general assembly of Delaware, which convenes at Dover. It is proposed to change the legal equipment requirements as to lights, etc., so as to conform to the regulations of neighboring states.

A commission also probably will be provided to look after the license bureau, the work having become so cumbersome that it is a great burden to the secretary of state, especially at the beginning and end of the year. It is proposed to have a commission, with members residing in different sections of the state, each with a license office.

### OHIO MAY INCREASE FEES

Columbus, Ohio, Jan. 31—Taking motor vehicles off the personal tax duplicate and substituting increase in the fees for the registration of such vehicles is the plan of a new law to be presented to the coming Ohio legislature. It is planned to return half of the money so secured to the communities in which the taxes originate. It is claimed that the plan is legal and workable if the recently adopted constitutional amendment classifying property for taxation is upheld by the courts.

The object of the bill is to tax motor vehicles heavily to provide for highway improvement and repair.



# The Readers' Clearing House

## Questions and Answers

Conducted by B. M. Ikert

### Skids on Front Axle

**Q**—GIVE me some idea how I could put runners under the front of my Ford in place of wheels for winter driving. Is such an attachment practical? Would the runners skid as much as the wheels? Would a short runner be better?—Robert Patterson, Taconite, Minn.

Repeated attempts to install runners on the Ford front axle have all proved a failure in some way or other, and it is very doubtful if such a thing can be done successfully.

### Records of Mulford in Hudson

**Q**—Publish side views of the Hudson cars driven by Mulford and Vail and the record of each?—T. D. Morris, Springfield, Ill.

Fig. 1 shows the Hudson car driven by Mulford, Ralph Mulford being at the wheel and Ira Vail to his right. We have no data on hand showing that Vail now holds any records whatsoever, but the records of Mulford are as follows, all being for class B stock cars, piston displacement 231 to 300 cu. in.: 10 miles, 76 m.p.h.; 20 miles, 76.25 m.p.h.; 50 miles, 75.70 m.p.h.; 100 miles, 74.90 m.p.h. All these were made at Sheepshead Bay, Nov. 25, 1915. In addition he drove the 1-mile straightaway at Daytona April 10, 1916, at a speed of 102.3 m.p.h.

### Water Leaks into Crankcase

**Q**—How can I stop water from leaking past the shaft of the water pump into the crankcase in my 1917 Oldsmobile eight? I have tried grease in the cup between the water pump and crankcase, but to no effect.—George Strauch, Refugio, Tex.

When greases applied to the water pumpshaft through the grease cup will not stop the leakage of water it is evident new packing is necessary. It is assumed you have gradually tightened up the packnuts. If you have not done so, do so now. Care should be exercised in tightening water pump packnuts, because if they are tightened too much the packing will be ruined and will not hold water regardless of the amount of grease applied. If it is necessary to replace the packing, a careful in-

### Miscellaneous

spection of the water pumpshaft should be made at that point where it comes in contact with the packing. If the shaft should be worn so that it no longer possesses a smooth and polished surface, new packing will do no good. The shaft must be replaced. This is common where not enough attention has been given to the cleanness of the water which is poured into the radiator. All water should be strained to prevent dirt and grit from entering the water pump and ruining the water pumpshaft.

### Serial Number of Model

**Q**—The number on the left frame of my four-cylinder Buick is 2340. What model is it?

**2**—What size ring gears and pinion does it take?

**3**—Where is the best place to have it repaired?—Frederick Johnson, Larson, N. D.

**1**—The model of your car is either 25 or 35. We have no code of the serial numbers with which the different models are marked and cannot inform you more definitely than the above.

**2**—The size of ring gear and pinion can be found by writing the Buick factory at Flint, Mich., at the same time informing them that the serial number of your car is 2340.

**3**—Buick is best able to furnish repair parts for your car.

### Danger of Using Chamois

**Q**—In the Dec. 5 issue you say, in regard to removing water from gasoline, do not use a chamois skin, as it is not only dangerous but not allowed in most filling stations. In what way is it dangerous?

**2**—Where can I get repair parts for a Jones speedometer used on a 1913 Mitchell six?—H. F. Murray, Geddes, S. D.

**1**—The use of a chamois skin to remove water from gasoline is dangerous because the passage or the filtering of the gasoline through the chamois skin produces a static electricity. If the funnel to which the

chamois is clamped is not grounded on the frame of the car, this electrical charge will be transmitted to the frame within the accompanying spark, which has been known to cause an explosion.

**2**—Repair parts for the Jones speedometer can be had from the nearest Mitchell dealer in your locality or by writing to the Jones Speedometer Co., Bush Terminal, Brooklyn, N. Y.

### Tire Size and Horsepower

**Q**—What kind of cork would you use to reline the clutch?

**2**—I use 37 by 5 in. tires. Is this right?

**3**—What is the horsepower of this car?—G. L., Farrell, Pa.

**1**—The cork lining on the clutch plates can be had from any Chalmers dealer. It is the regular variety of cork and on your car is  $\frac{3}{8}$  to  $\frac{1}{2}$  in. thick.

**2**—You are using the correct tire size.

**3**—The N. A. C. C. horsepower rating for your car is 38.4.

### Two Exhausts on Car

**Q**—My Oldsmobile, model 45, eight-cylinder touring car is equipped with but one exhaust pipe and muffler. Would this engine furnish more power and speed if it were equipped with two exhaust pipes and mufflers? If so, how much?

**2**—What is the gear ratio of this car?—Frank Denlinger, Eaton, Ohio.

There is no doubt that two exhaust pipes of the same size as the one installed would assist in relieving the back pressure of the exhaust, but it is doubtful if any appreciable difference in speed could be noticed, as the present exhaust system is of sufficient capacity to carry off the exhaust gases without sacrificing either power or speed.

### Race Records

**Q**—Was not the Blitzen-Benz that Burman made the world's record for 1 mile in built for Barney Oldfield?

**2**—Did Duray make any records in his Fiat at Ostend, Belgium? I heard that he attained a speed of 147 m.p.h.

**3**—Was I misinformed or were his records not recognized?—H. R. Palmer, Denver, Col.

**1**—Burman bought the Bitzen-Benz car from Barney Oldfield.

**2**—Duray did make a record with his Fiat. The speed was 142.9 m.p.h.

**3**—The record is not held as official, although the speed is admitted.

### Buick and Dodge Clutches

**Q**—Give instructions to tighten clutch that slips on a Buick 4, model E38.

**2**—Publish diagram showing how to remove clutch to reface.

**3**—Show how a 1916 Dodge Brothers cone clutch can be removed.—O. B. Hickman, Forrester, Tex.

**1**—In Fig. 3 is an illustration of the Buick clutch used on your car. It may be that the slipping is caused by the leather of the clutch being soaked with oil. If this is the case, the leather should be washed with gasoline to remove the oil. If this does not help the clutch, the spring must be adjusted. The nut marked A is

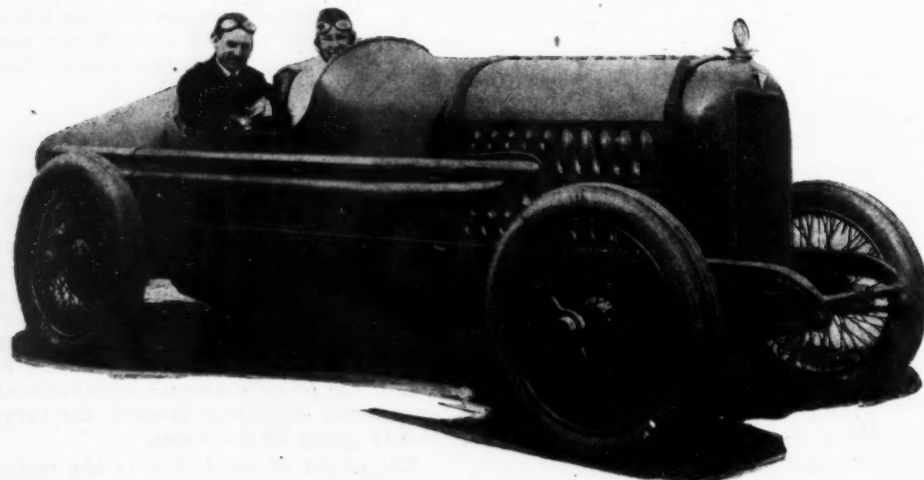


Fig. 1—Hudson car driven by Ralph Mulford on the speedways



one of the three adjusting nuts. Care must be exercised in tightening these up to see that the three are tightened the same amount, or else the power will be applied on one side of the clutch and thereby cause a serious side strain.

2—It is always considered best to have a garageman install a new facing on a clutch, as more tools than the average person has are required to do the job. It is a serious task to remove the housing around the gearset and the clutch, which means that the levers first must be removed with the toggles and the release yoke and all the other things connected with it.

3—It is more difficult to remove a Dodge Brothers clutch than a Buick, the Dodge being a disk and having, therefore, more parts. We would advise that a reliable garageman do this work for you.

#### Discussion of Mitchell Spring

Q—A certain Mitchell dealer says he has the easiest-riding car in the world. Show a picture of the springs on a Mitchell, and tell us why, if so?

2—What company made the first successful six in any numbers?

3—Has a Mitchell Bate cantilever spring ever broken?—E. G. Holmes, Madison, Wis.

1—It is not for MOTOR AGE to say that one company produces an easier riding spring than another. In Fig. 2 will be found an illustration of the Bate cantilever spring. It is a very long cantilever spring, and the essential difference between it and other cantilever springs is that the two bottom leaves of the spring are connected to the block which surrounds the rear axle. The bottom leaf is connected to the rear end of the shackle block, and the next to the bottom leaf to the front end of the block. This can be seen in Fig. 2. As the spring flexes when going over a bump the leaves of the spring naturally slide on one another, and since the rear axle has two leaves of the spring fastened to it a rocking motion of the rear axle is obtained in conjunction with the natural motion due to the bump. Perhaps this accounts for the claim of Mitchell with reference to their spring.

2—Winton was the first company to produce sixes successfully. The Winton production, though, could never be referred to as quantity production, their output always having been confined to a small number of well made cars.

3—The Mitchell states more than 40,000 cars have been turned out equipped with the Bate spring, not one of which has broken.

#### Car Hard to Start

Q—My Ford has become very hard to start. The only way I can start it now is to jack up one hind wheel or rear wheel and release the brake to let it in high gear. When I do this it is not very hard to get it started. I cannot start it any other way except by doing this. It worked very nice up to about two months ago, when it began to start hard. It gradually kept getting a little harder till it got so I could not get it started without this trouble. The magneto seems to be in good condition, and also the coil and wiring. I have put on a new timer, but it did no good. After the engine is started the car works fine.—Herbert Smeed, Waltherville, Ore.

You have not said whether your Ford is hard to start because of hard cranking or that it is slow in firing when cranking. Throwing the mechanism in high gear is a relief for either of these ailments under certain conditions, and it is assumed that one of three conditions are responsible: The high-speed clutch fails to fully re-

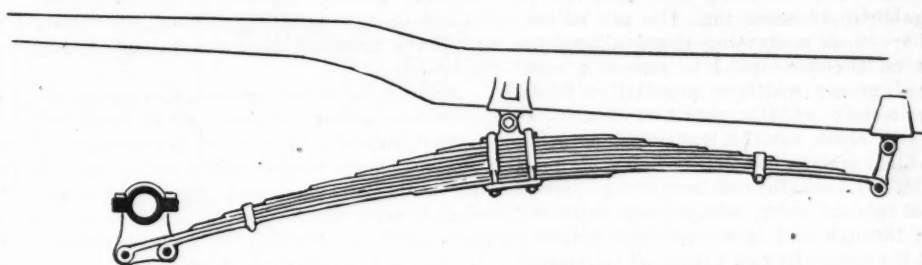


Fig. 2—Bate cantilever spring such as is used on the Mitchell car

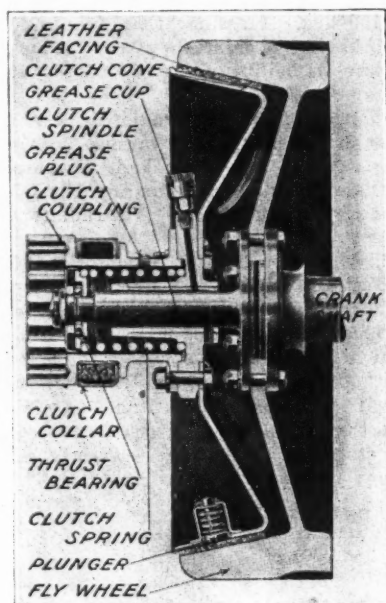


Fig. 3—Clutch used on Buick, showing makeup

lease when in neutral, the slow-speed, or reverse, bands are too closely adjusted or the rear crankshaft bearing is worn so as to permit too great a clearance between the magnets and the magneto coil.

Locating the exact source of trouble must supersede the remedy in this case. Begin by removing the transmission slop-

ing door and loosen the reverse band and the slow-speed band so the pedals, when pressed forward, will travel their entire distance. Now crank the engine to determine whether it is absolutely free from any drag. Place the high-speed lever in a neutral position but not far enough back to apply, in any way, the emergency brake. Again crank the engine, and notice if there is any drag and whether the car has a tendency to creep forward during the cranking operation. If it does, this is an indication the high-speed clutch is dragging.

To remedy this locate the adjusting screw, which will be found on the lever of the clutch release shaft at the left and outside of the transmission. This screw will be found to make contact with a lever which is a part of the high-speed lever shaft, and a close inspection undoubtedly will reveal that the adjusting screw is badly worn. Loosening the locknut and turning this screw down a few turns, if it can be turned down farther, will increase the leverage of the clutch shaft, thereby releasing the pressure on the clutch disks when the transmission is in neutral. Having done this, adjust the slow-speed and reverse bands so they will function properly and will not bind. Replace the parts removed and try starting the engine in the usual manner. If the rear main bearing is not worn so badly as to throw the magnets out of adjustment with the coil, no trouble should be encountered in starting. In case the magneto is out of adjustment the only permanent remedy is to replace the rear main bearing cap and shim the coil so that a clearance of about  $\frac{3}{4}$  in. exists between the two. This, of course, will necessitate the removal of the power-plant.

TO assist readers in obtaining as a unit all information contained in this department on a certain subject MOTOR AGE segregates inquiries into divisions of allied nature. Questions pertaining to engines are answered under that head, and so on.

#### MISCELLANEOUS

Robert Patterson.....	Taconite, Minn.
T. D. Morris.....	Springfield, Ill.
George Strauch.....	Refugio, Tex.
Frederick Johnson.....	Larson, N. D.
H. F. Murray.....	Geddes, N. D.
G. L.....	Farrell, Pa.
Frank Denlinger.....	Eaton, Ohio
H. R. Palmer.....	Denver, Col.
O. B. Hickman.....	Forreston, Tex.
E. G. Holmes.....	Madison, Wis.
Herbert Smeed.....	Waltherville, Ore.
E. L. Goss.....	San Jose, Cal.
W. M. Maggart.....	Kokomo, Ind.
B. C. Bradford.....	St. Paul, Minn.

#### ENGINES

J. Bernstein.....	Youngstown, Ohio
Wright Elsom, Jr.....	Oak Park, Ill.
Louis Jaegl.....	Streator, Ill.
Otto Summers.....	Dayton, Ohio

#### THE ELECTRIC SYSTEM

H. W. Pierson.....	Marion, Ore.
G. L.....	Farrell, Pa.
E. L. Goss.....	Mt. Clemens, Mich.
Evart Garage.....	Evart, Mich.
W. P. Fandle.....	Alliance, Ohio
A. W. Kemper.....	Tarkio, Mo.
W. M. Maggart.....	Kokomo, Ind.

No communication without the writer's name and address will be answered in these columns.

#### Grinding Gear Teeth

Q—I have heard that by grinding the outer tips of the teeth in the master gear on the Overland 82, rear end trouble can be eliminated. Two new gears have been put in and a new one was in when I obtained the car last July. Tests have shown the teeth are meshing right. The rear end is in line correctly.

2—When starting in second gear for some time and then trying to start it in low it is hard to shift into second without stopping the car. Why? It is the same with a Dodge Brothers or a Hudson Super-Six when a person drives with their hand throttle while shifting. Some do it very nicely, but to have another person get in and shift, using the foot accelerator, it is quite impossible. But if the car had been driven and shifted with the foot throttle at first and then have someone shift, using the hand throttle, it can be done nicely.—E. L. Goss, San Jose, Cal.

1—The rear axle transmission and the ring gear of the differential are subjected to a greater abuse than if the transmission is in unit with the engine. This causes a weaving of the axle housing and consequent interference of the gear teeth. Grinding down the tips of the teeth will help to eliminate this interference of teeth and



the consequent breaking that then occurs.

2—It would seem that the use of second speed as a starting speed allows the gear on the first speed to collect a coating of grease which is prohibitive to an easy motion of the gearshift lever. If you will clean out the transmission casing and fill it with a non-fluid oil of some kind and then want to continue using second speed to start with, occasionally shift the lever through first speed, and this will prevent the congealing of a layer of oil around the first-speed gear. The hand throttle is a more delicate means of controlling the engine speed than is the foot accelerator. Consequently after driving a while using the hand throttle, one is accustomed to getting just the speed variations wanted to shift gears without clashing. So when the foot accelerator is used the speed of the engine is more of an undetermined quantity for a while at least, until the driver becomes accustomed to the feel of the foot pedal, hence a clashing of the gears is the evident result.

#### Condition of Valve Seat

Q—What kind of a seat holds the best on a valve, a dull gray, smooth seat, or a hard, polished seat?—Wilmer M. Maggart, Kokomo, Ind.

Opinion varies with regard to the condition of the valve seat. The main consideration with regard to the valve seat is to see that there is ring contact around the entire sea of the valve. No pit marks, grooves or ring marks due to imperfect seating should be tolerated. A hard polished seat has the advantage that no deposit can collect on the seat without being readily seen. A hard polished seat is an indication of more time spent in the obtaining of a good surface.

#### Alcohol and Water

St. Paul, Minn., Editor MOTOR AGE—I believe some correct information as to the proper mixture of alcohol and water in the cooling system of motor cars will be of value to your readers. In your Dec. 6, 1917, issue you give an anti-freeze mixture of alcohol and water, showing two mixtures, one using a denatured alcohol and the other wood alcohol.

From what I can gather, wood alcohol is not used, first, because of the danger from the vapors, which are poisonous, and, second, because of the low boiling point. De-

natured alcohol appears to be used generally in this territory, where, of course, we have absolute need for an anti-freeze solution.

From what I can gather, denatured alcohol is a mixture of grain, ethyl, wood and methyl alcohols. Just what percentages of the two I have not been able to find out. I am told that denatured alcohol is grain alcohol with about from 5 per cent to 10 per cent wood alcohol. There has apparently been a good deal of guess work.

I understand the boiling point of grain alcohol is 172 deg., and of wood alcohol about 150 deg. I assume that denatured alcohol, having a mixture of the above, would have a boiling point of 165 to 168 deg.

The danger of freezing radiators is not so great if the engine is warmed before starting out and the water kept circulating. It is when the car is standing idle for any length of time that the radiators freeze.

Would it not be helpful to motorists if you published a correct anti-freeze mixture of water and denatured alcohol, showing the various percentages of mixture by volume and the temperature at which the mixture will freeze and boil, also the specific gravity of the different percentages of mixture, so that same may be readily tested with a standard hydrometer such as the following:

Per cent alcohol	Freezes at	Boils at	Specific gravity
10	22 deg.	206 deg.	987
20	10 deg.	202 deg.	975
25	4 deg.	199 deg.	969
30	2 deg.	196 deg.	963
40	14 deg.	191 deg.	951
50	26 deg.	186 deg.	935
60	38 deg.	181 deg.	923

I make this suggestion for the reason that I have seen half a dozen anti-freeze mixtures of alcohol and water, no two of them being alike.—B. C. Bradford.

## Engines

#### Buick Engine Timing

Q—Explain your article in the Dec. 5 issue on timing Buick engines. As I understand valve setting, the flywheel should be turned until mark "exhaust closes 1 and 4" and 1 and 6 would be exactly in line with pointer and then set camshaft gear so that exhaust valve on 1 or 6 would just be fully closed, but you say pass pointer  $2\frac{1}{2}$  in. Is that correct?

2—Give timing of No. 1 cylinder of Packard Twin-Six by flywheel.—J. Bernstein, Youngstown, Ohio.

1—Yes, it is correct to pass the pointer  $2\frac{1}{2}$  in. If the exhaust valve were set to close when the mark piston just reached the top of its stroke, no advantage could be taken of the inertia set up in the gas by its being forced out of the cylinder. The piston when coming up on the scavenging stroke forces the burnt gasses out through the exhaust passage. When the piston's upward motion has stopped, its power to force out more gas is gone, but a partial vacuum can be created within the cylinder by allowing the velocity of the exhaust gas to decrease by taking from it the energy which it has, due to its velocity, and using it in creating a partial vacuum. The wisdom of this can be seen as soon as the intake valve opens on the next downward stroke of the piston.

2—In timing a Twin-Six Packard, first remove the inclined front floorboard and the cover over the flywheel and open all cylinder priming cocks. Turn the engine over slowly by hand until the emission of air from the priming cock of the right front cylinder denotes compression in that cylinder. Continue to turn carefully until the inscription on the flywheel "top dead center cylinder 1" on the flywheel is  $\frac{3}{8}$  in. past the highest point in its travel. Remove the right distributor head from the ignition apparatus and rotate the distributor arm until its position corresponds with the position of the No. 1 terminal on the distributor head. Keep the spark lever in its upper, or retarded, position. This lever is on the left side of the ignition apparatus near the bottom. The ignition apparatus now may be set in place and all connections made.

In setting valves the arrow on both the crankshaft and the camshaft gears should point directly upward and be in line with the arrow on the front cover face of the engine. In this position the inscription on the flywheel "exhaust closes 1 and 6R" will be on the top dead center line of the engine, which is the center between the two cylinder blocks, and No. 1 right piston will be in the firing position.

#### Two Engines in Tandem

Q—If two Ford engines are coupled in tandem and sparked with an Atwater Kent ignition system, should there be less vibration than in one Ford engine running alone? Our firing order is 1-1, 2-2, 4-4, 3-3. We have two Ford engines bolted between channel iron and coupled at the crankshaft with a very finely-made universal. Our first test on the engine bench made for the job is very disappointing. Before we go too far and also lengthen the Ford frame to fit we would like your opinion.—Wright Elsom, Jr., Oak Park, Ill.

Two Ford engines coupled in tandem, if properly set and timed, would offer less vibration than a single engine. Judging from the wording of your question we believe that you are securing ignition for both engines from the one system and, of course, in doing so the corresponding cylinders of each engine are firing at the same time. If this be the case, there is no doubt that the two engines would vibrate a great deal more than one engine, for two reasons, first, the power strokes of the two engines are in reality the actuation of the power strokes of one engine, being 90 deg. apart; second, the one flow of current from the distributor divided between two cylinders either will cause one of the two cylinders to miss or fire unevenly, because the current will follow the line of least resistance. It is almost im-

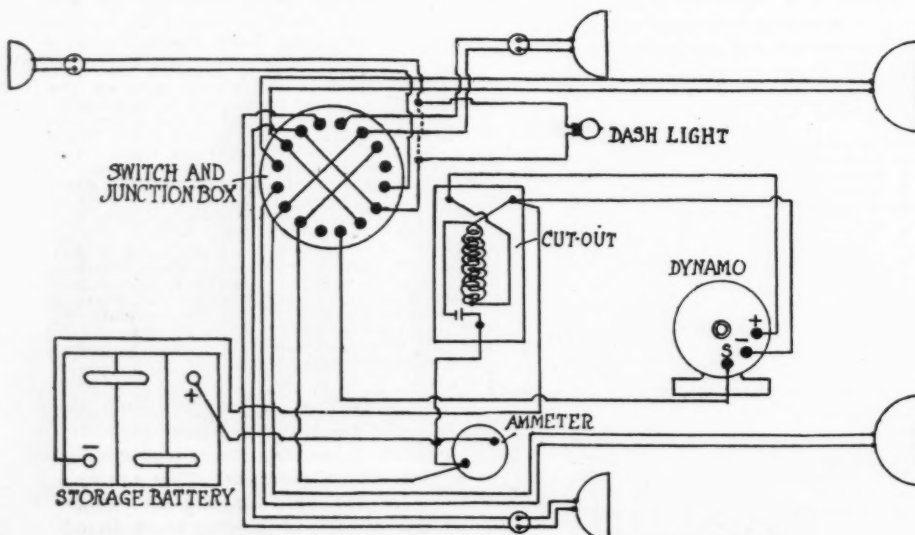


Fig. 4—Wiring diagram of Gray & Davis system on Chalmers



possible to adjust the gap of the spark plugs so that the resistance would be equal, and if this could be done, any variation of compression in either of the cylinders would tend to increase or decrease the resistance of one to the other. Do not attempt to distribute your ignition in this manner.

If you know that there is any special advantage in the arrangement you have described, you may proceed with it, but it must be done in this manner: Disconnect the two engines and reconnect them so that the firing will come in this order, 1-4-2-3-4-1-3-2. The firing order of the front engine is 1-2-4-3, and the firing order of the rear engine is, of course, identical with the front but instead of the two No. 1 cylinders firing at the same time No. 1 cylinder of the second engine fires just half way between 4 and 3 of the first engine. Instead of the explosions occurring every 90 deg. they will occur every 45 deg. This makes the firing of the two engines practically identical with the eight-cylinder engine.

This also will relieve the powerplant of the vibration bound to occur in the original set-up. Equip each powerplant with a separate ignition system and you then can be assured of a good spark occurring in each of the eight cylinders, which will eliminate any vibration set up by uneven firing. There would be some advantage in removing the transmission from the engine, which would not require a transmission. It would assist in cutting down the weight, and because the Ford transmission sets up a vibration to a certain extent it would assist in eliminating all vibration.

#### Fitting New Piston Rings

Q—My Buick B55, 1914, leaks compression, and I desire to fit non-leaking. Shall I replace all the rings on each cylinder or just the top ring on account of the oil passing over the rings?—Louis Jaegl, Streator, Ill.

If the cylinders are not worn beyond that point where non-leaking rings will remedy the trouble of oil passing by the rings, they may be installed, but it is advisable to fit them on the top two piston grooves.

#### Coasting with Open Cocks

Q—Will car coast down a 20-per cent grade with the throttle closed and the switch off faster with the priming cocks open or with them closed?—Otto Summers, Dayton, Ohio.

Opening the petcocks, thereby relieving the cylinders of compression, will permit a car to coast down hill with greater speed. This can be proved without trying it on a hill. Just open the petcock or, better still, remove the spark plugs and note the difference in the effort required in cranking the engine.

## The Electric System

#### Mounting of Generator

Q—I mounted a generator on my series A Stutz and would like your opinion regarding the speed at which it should be driven. It is a Ward Leonard 6-volt with cut-out and is mounted over the pumpshaft and geared to run at six times crankshaft speed. I wish it to begin charging at about 8 m.p.h., the car having, I believe, the standard Stutz gearing of about 3½ to 1 on high.

2—Have I geared this instrument too high for good results? The factory states the generator is to run at 1800 r.p.m., but does not seem to be able to give me a definite answer regarding the gearing.—H. W. Pierson, Marlon, Ore.

1-2—At a speed of 8 m.p.h. the engine

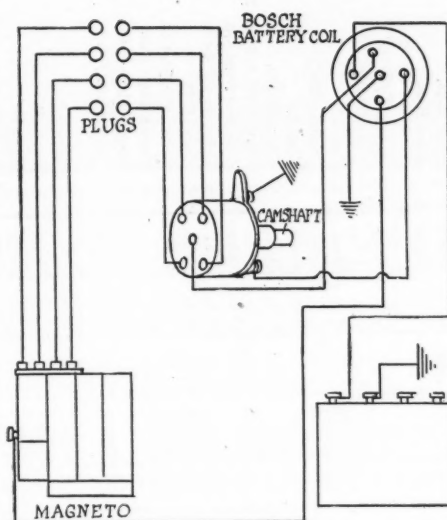


Fig. 5—Wiring diagram of Bosch D4 dual electric system

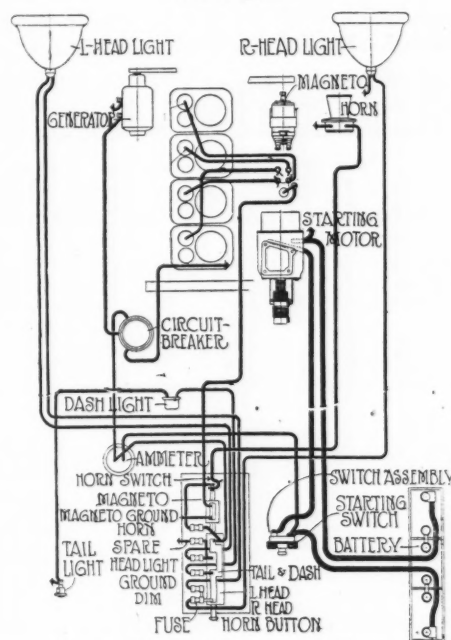


Fig. 6—Wiring diagram of system used on Overland 82

of your car is turning over about 380 r.p.m. and if your car increases its speed to about 65 m.p.h. the engine will then turn over at about 2400 r.p.m., so if you gear the generator up to 6 to 1 its speed will be 14,400 r.p.m., which will blow the armature to pieces by the centrifugal force. Make the gear ratio 2 to 1, and adjust the brushes of the generator. The regulator will cut in when going about 12 m.p.h.

#### Ignition Wired Wrong

Q—I have a Chalmers model 24 limousine. The engine is in good condition. I have recently had the valves reground and had new patented rings installed. I can get no power from the engine. The car will not climb a moderate grade in fourth or third. Backfires in the carburetor occur continually and I cannot get the carburetor adjusted by anyone to prevent this. When the engine stops about a quart of gasoline will run out of the carburetor. My mileage is 4 m.p.g. What is the trouble with it?

2—How far before dead center should a magneto be set.—G. L., Farrell, Pa.

1—The trouble is not with your carburetor but is with the wiring system. Some wires have been changed in the ignition system which allows one cylinder to fire when that cylinder is on its intake stroke. This is the cause for your backfires through

the carburetor and the excessive dripping of gasoline when the engine stops. Of course, some dripping is to be expected with the fuel we have to use now because of the condensation in the manifold, but this should not exceed two or three drops.

2—A magneto for the Chalmers 24 is timed with the spark lever fully retarded, and the pointer on the flywheel 1½ in. past the mark of dead center.

#### Wiring Diagram for Overland

Q—Publish wiring diagram for an Overland, model 82.—E. L. Goss, San Jose, Cal.

This is shown in Fig. 6.

#### Wiring Diagram of Bosch

Q—Show wiring diagram of Bosch D4 dual system.—Evans Garage, Mount Clemens, Mich.

A wiring diagram of this type is shown in Fig. 5.

#### Wiring of Everitt

Q—Show wiring diagram of Everitt six with Splittdorf low-tension magneto.—Evart Garage, Evart, Mich.

We have no diagrams showing this. Possibly some of our readers can help you out.

#### Wiring Diagram of Chalmers

Q—Give wiring diagram of Chalmers 1916 cab, Gray & Davis two-unit system.—W. P. Fandee, Alliance, Ohio.

The wiring diagram of the 1916 Chalmers, Gray & Davis system, is shown in Fig. 4.

#### Graphite and the Magneto

Q—Will flake graphite added at the rate of a teaspoonful to a gallon of lubricating oil short-circuit a Ford magneto?

2—How can it be remedied after it has?

3—Will a 9-volt 15-cp. light burn out sooner than a 9-volt 18-cp. light?—A. W. Kemper, Tarkio, Mo.

1—Yes, but not completely. It will decrease the efficiency of the magneto.

2—One way to remedy this is to discharge the magnets as described in the Sept. 13 issue of MOTOR AGE. When the magnets are completely discharged the graphite will cease to be attracted, and if the flywheel is turned over several times with the hand crank the oil will wash the graphite from the magnets. The oil then can be drained, thereby removing all foreign articles from the crankcase. When this is done the magnets can be recharged as described in the same issue. If you are not certain you can accomplish your purpose in this manner, the other way of removing the graphite is to remove the transmission case and collect the flakes from the magnets with a cloth as the flywheel is rotated.

3—There is no reason why a 15-cp. lamp should burn out any sooner than an 18-cp. lamp.

#### Starter Robs Ignition of Current

Q—Is it possible for an electric starting motor to rob a storage battery of so much current when starting a car as to interfere with the ignition?

2—Is the failure to start when the battery becomes weak just because the starting motor does not turn over fast enough to obtain sufficient compression in the cylinders to render the gas combustible?—Wilmer M. Maggert, Kokomo, Ind.

1—Yes, an electric starting motor can rob the battery of so much current that there will not be enough left for the ignition system to run on.

2—If the speed of the starting motor is slow enough, starting will become impossible, because the compression may leak away before it can fire or the voltage may be so low that the current left for the ignition system will be insufficient.



# Motor Age Monthly Passenger Car Specification Tables

These prices apply to five and seven-passenger models only

Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. H. P.	Carburetor Make and Size	Fuel Feed	Clutch	Gears	Universal	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages	Name and Model
Allen 41	5	\$1105	112	32x33	optional	33x45	Own	4	22.50	1-Stron.	Vacuum	B. and B.	Own	Arvac	Adams	Litwiler	Stewart	Firestone	6	90	U. S. L.	A-L	A-L	Conn.	6	Allen 41
American B.	7	1805	122	33x34	Firestone	33x55	Ruten.	6	23.44	1-Zen.	Vacuum	B. and B.	G-L	Arvac	Salisbury	Gemmer	V. Sicken	Stanwell	6	100	Col.	G. & D.	A-K	6	American P.	
American Beauty 1.	5	2000	121	33x41	optional	33x55	Ruten.	6	23.44	11/2-Ray.	Vacuum	B. and B.	Warner	Arvac	Timken	Warner	Warner	Firestone	6	100	Willard	G. & D.	Remy	6	American Beauty 1.	
Anderson 400-A.	7	1750	120	33x34	Federal	33x45	Cont.	8	25.35	1-Zen.	Vacuum	Own	Own	Arvac	Col.	Jacox	Stewart	Firestone	6	80	Willard	West.	Conn.	6	Anderson 400-A.	
Apperson 8-18.	7	4000	130	33x34	optional	33x45	Own	8	33.80	John.	Vacuum	Own	Own	Sterling	Own	Own	Stewart	Firestone	6	80	Willard	Bijur	Remy	6	Apperson 8-18.	
Auburn 6-39.	5	1595	120	33x4	Goodrich	33x43	Cont.	6	25.35	1-Ray.	Vacuum	B. and B.	G-L	Hart.	Col.	Jacox	Stewart	Firestone	6	80	Willard	Remy	Remy	6	Auburn 6-39.	
Austin 12.	6	4250	142	34x43	Goodrich	27x45	Weid.	12	39.68	11/2-Stron.	Vacuum	Muncie	Own	Spicer	Own	Lavine	Warner	Firestone	6	80	Willard	Delco	Delco	6	Austin 12.	
Biddle H.	4	2750	121	32x4	optional	33x55	Buda	4	22.50	11/4-Zen.	Vacuum	Warner	Own	Spicer	American	Gemmer	Warner	Perl-Jack.	6	90	Willard	G. & D.	Eise.	6	Biddle H.	
Briscoe 4-24.	5	885	104	30x33	optional	33x55	Own	4	15.20	1-Buick	Gravity	Own	Own	Own	Own	Own	Stewart	Own	6	80	U. S. L.	A-L	A-L	Conn.	6	Briscoe 4-24.
Buick H-45.	5	1495	118	32x34	Goodyear	33x43	Own	6	27.34	Mar.	Vacuum	Own	Own	Own	Own	Own	Stewart	Own	6	60	U. S. L.	Delco	Delco	6	Buick H-45.	
Buick H-49.	7	1785	124	34x43	Goodyear	33x43	Own	6	27.34	Mar.	Vacuum	Own	Own	Own	Own	Own	Stewart	Own	6	60	U. S. L.	Delco	Delco	6	Buick H-49.	
Cadillac 57.	7	3220	125	35x55	optional	33x55	Own	8	31.25	11/2-Own	Pressure	Own	Own	Spicer	C-Timk.	Own	V. Sicken	Kelsey	6	80	Exide	Delco	Delco	6	Cadillac 57.	
Campbell C-4.	5	1000	110	30x33	Goodyear	33x54	Own	4	24.03	Sund.	Vacuum	Muncie	Own	Stanwell	Salisbury	Own	V. Sicken	Firestone	6	117	Willard	A-L	A-L	Conn.	6	Campbell C-4.
Case U.	7	125	125	32x34	Goodyear	33x55	Cont.	6	29.40	11/4-Ray.	Vacuum	B. and B.	G-L	Arvac	Col.	Jacox	Stewart	Firestone	6	93	Willard	West.	West.	6	Case U.	
Chalmers 35-C	5	1555	117	32x34	optional	33x43	Own	6	25.35	11/4-Stron.	Vacuum	Own	Own	Timken	Own	Own	Stewart	Kelsey	6	100	Willard	West.	Remy	6	Chalmers 35-C.	
Chandler.	7	1795	123	32x4	Goodyear	33x55	Own	4	21.76	11/4-Ray.	Vacuum	B. and B.	Own	Hartford	Own	Gemmer	Stewart	Perl-Jack.	6	100	Willard	West.	Bosch	6	Chandler.	
Chevrolet 4-90	5	735	102	30x33	Goodyear	33x44	Own	4	21.76	11/2-Zen.	Vacuum	Own	Own	Own	Own	Warner	Stewart	Perl-Jack.	6	50	Willard	A-L	A-L	Will.	6	Chevrolet 4-90.
Chevrolet F. A. 5 and 2	5	1045	108	32x33	Goodyear	33x54	Own	8	39.20	11/2-Zen.	Vacuum	North.	Own	Spicer	Col.	Gemmer	Stewart	Kelsey	6	80	Willard	Delco	Delco	6	Chevrolet F. A. 5 and 2	
Cole Aero Eight 870.	7	2595	127	33x5	Goodrich	33x43	North.	8	39.20	11/4-Stron.	Vacuum	B. and B.	Own	Spicer	Timken	Col.	Gemmer	Kelsey	6	80	Pres.	Delco	Delco	6	Cole Aero Eight 870.	
Columbia CD and CS.	5	115	115	32x4	Firestone	33x43	Cont.	6	25.35	1-Stron.	Vacuum	B. and B.	Own	Spicer	Timken	Col.	Gemmer	Firestone	6	75	Willard	W-L	A-K	6	Columbia CD & CS.	
Comet C-51.	5	1685	125	33x4	Goodyear	33x43	Cont.	6	29.40	11/4-Ray.	Vacuum	B. and B.	Own	Muncie	Arvac	Col.	C. A. S.	Stewart	Firestone	6	80	Willard	Dyn.	Delco	6	Comet C-51.
Commonwealth 4-40	5	1095	115	32x35	optional	33x55	Gray	4	19.60	1-Zen.	Vacuum	B. and B.	Covert	Ther-H.	Peru	Ditweiler	Warner	Firestone	6	80	Willard	Dyn.	A-K	6	Commonwealth 4-40.	
Crow-Elkhart K-36.	5	1095	115	32x33	optional	33x55	Revten.	4	19.60	1-Zen.	Vacuum	B. and B.	Covert	Ther-H.	Peru	Ditweiler	Warner	Firestone	6	100	Willard	Dyn.	Delco	6	Crow-Elkhart K-36.	
Crow-Elkhart K-46.	5	1295	116	32x33	optional	33x55	Revten.	4	19.60	1-Zen.	Vacuum	B. and B.	Covert	Ther-H.	Peru	Ditweiler	Warner	Firestone	6	100	Willard	Dyn.	Delco	6	Crow-Elkhart K-46.	
Cunningham V-3.	7	4250	132	35x55	optional	33x45	Own	3	45.00	11/2-Stron.	Vacuum	B-L	Own	Spicer	Timken	Gemmer	Warner	Firestone	6	120	Willard	West.	Delco	6	Cunningham V-3.	
Daniels B.	7	3750	127	34x43	optional	33x45	H-S	3	33.80	1-Zen.	Vacuum	B-L	Own	Spicer	Timken	Gemmer	Stewart	Firestone	6	100	Willard	West.	Delco	6	Daniels B.	
Davis J.	7	2050	124	34x43	optional	33x55	Cont.	6	29.40	Stron.	Vacuum	B. and B.	Warner	Arvac	Timken	Warner	Stewart	Firestone	6	100	Willard	West.	Delco	6	Davis J.	
Davis H.	7	1655	119	34x4	optional	33x43	Cont.	6	25.35	Stron.	Vacuum	B. and B.	Warner	Arvac	Timken	Warner	Stewart	Firestone	6	100	Willard	West.	Delco	6	Davis H.	
Dixie Flyer L.	5	1095	112	32x33	Goodyear	33x43	Lyc.	4	16.90	1-Carter	Vacuum	B. and B.	G-L	Arvac	Peru	C. A. S.	V. Sicken	Firestone	6	60	Willard	Dyn.	Conn.	6-3	Dixie Flyer L.	
Dodge Brothers	5	1085	114	32x33	optional	33x43	Own	4	24.03	1-Stew.	Vacuum	Own	Own	Own	Own	Own	V. Sicken	Firestone	6	115	Willard	N. E.	N. E.	12	Dodge Brothers.	
Dorris 6-80.	7	3500	132	35x55	optional	4x5	Own	6	38.40	11/2-Stron.	Vacuum	B-L	Own	Spicer	Timken	Warner	V. Sicken	Firestone	6	85	Willard	West.	Bosch	6	Dorris 6-80.	
Dort 15.	5	925	105	30x33	Goodyear	33x45	D-Lyc.	4	19.60	1-Carter	Vacuum	Own	Mechanics	Mechanics	W-Weiss	Jacox	Stewart	Jackson	6	85	Willard	West.	Conn.	6	Dort 15.	
Elcar.	5	1175	116	32x33	Firestone	33x55	Lyc.	4	19.60	1-Carter	Vacuum	Mechanics	Mechanics	Mechanics	Salisbury	Foster	Stewart	Firestone	6	90	Willard	Dyn.	A-K	6	Elcar.	
Elcar.	5	1375	116	33x4	Firestone	33x43	Cont.	6	25.35	11/4-Stron.	Vacuum	B. and B.	Own	Muncie	Salisbury	Foster	Stewart	Firestone	6	90	Willard	Dyn.	A-K	6	Elcar.	
Elgin Series H.	5	1395	118	33x4	optional	33x43	Falls	4	23.44	1-Stron.	Vacuum	B. and B.	Own	Mechanics	Adams	C. A. S.	V. Sicken	Firestone	6	90	Willard	Wagner	Wagner	6	Elgin Series H.	
Essex A.	5	1395	108	32x4	optional	33x55	Own	4	18.23	Own	Vacuum	Own	Own	Spicer	Timken	Own	Stewart	Firestone	6	105	Willard	Delco	Delco	6	Essex A.	
Ford T.	5	525	100	30x33	Goodyear	33x44	Own	4	22.50	H-K	Gravity	Own	Own	Own	Own	Own	none	none	6	12	Willard	Dyn.	none	9	Ford T.	
Franklin 9	5	2450	115	33x43	Goodyear	33x44	Own	6	25.35	1-Own	Vacuum	B. and B.	Own	Own	Own	Own	none	none	6	50	Willard	Dyn.	A-K	12	Franklin 9.	
Geronimo	7	1595	122	32x4	Goodyear	33x55	Ruten.	6	23.44	1-Stron.	Vacuum	B. and B.	Own	Hart.	W-Weiss	C. A. S.	Stewart	Firestone	6	88	Willard	Dyn.	Delco	6	Geronimo.	
Glide 6-40	5	1655	119	34x4	Goodyear	33x55	Ruten.	6	23.44	1-Ray.	Vacuum	Own	Own	Spicer	American	Ditweiler	Stewart	Goodyear	6	80	Willard	West.	West.	6	Glide 6-40.	
Grant.	5	1220	114	32x33	optional	33x43	Own	6	21.60	Stron.	Vacuum	Durston	Own	Mechanics	Peru	Jacox	V. Sicken	Stanwell	6	90	Willard	Wagner	Wagner	6	Grant.	

Engines—Ruten, Cont., Continental; Weid, Weidely; North, Northway; H-S, Herschel-Spinner; Lyc., Lycoming; D-Lyc., Dort-Lycoming; G. B. & S., Golden, Belknap & Swartz; T-McF., Teator-McFarlane; M., Monson or Duesenberg; R. & V., Root & Van Dervoort. Carburetor—Stron, Stromberg; Zen, Zenith; Ray, Rayfield; John, Johnson; Mar, Marvel; Sund, Sunderman; Siew, Stewart; H-K, Holley-Kington; New, Newcomb; Scheb, Schieber; Tiltot, Tiltson; Johns, Johnston. Generator and Motor—A-L, Auto-Lite; West, Westinghouse; W-L, Ward Leonard; Dyn, Dyneco; N. E., North East; L-N, Leese-Neville; A-C, Allis-Chalmers; Split, Splitdorf; S-N, Simms-Huff; G. & D., Gray & Davis. Ignition—A-K, Atwater-Kent; Conn., Connecticut; Eise, Eisemann; West, Westinghouse; Will, Willard; N. E., North East; K-Remy, Kingston-Remy; Berl, Berling; Bosch-W, Bosch-Westinghouse; Split, Splitdorf. Gearset—G-L, Grant-Lee; North, Northway; B-L, Brown-Lipe. Rear Axle—Col, Columbia; W-Weiss, Walker-Weiss; C-Timk, Cadillac-Timken; West-Mott, Weston-Mott. Universals—Hart, Hartford; Ther-H, Thermoid-Hardy; U. M. Co., Universal Machine Co. Speedometer—J-Man, John-Mansville; V-Sicken, Van Sicken. Tire—



Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. H. P.	Carburetor Make and Size	Fuel Feed	Clutch	Transfer	Universals	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages	Name and Model
Harroun	5	995	106	30x3 1/2	31x45 1/4	3x3 1/2	Own	4	16.90	1-Ström.	Vacuum	Own	Mechanics	Own	Adams	Genmer	Stewart	Stanweld	6	80	Willard	Remy	Remy	A-K.	6-3	Harroun.
Harvard 4-20.	2	850	100	28x3	31x45 1/4	3x3 1/2	G. B. & S.	4	14.40	1/2-Zen.	Gravity	Own	G-L	Blood	Peru	Barnes	Warner	Hook	6	100	National	Wagner	Wagner	A-K.	6-3	Harvard 4-20.
Hatfield A.	5	1180	115	32x4	31x45 1/4	3x3 1/2	Own	4	22.50	1-Zen.	Vacuum	B. and B.	Own	Own	Own	Jacob	Stewart	Firestone	6	120	Willard	Dyn.	Conn.	6	Hatfield A.	
Haynes 46	7	127	127	34x4 1/2	27x45 1/4	3x3 1/2	Own	12	36.30	Ray.	Vacuum	B. and B.	Own	Own	Own	Own	Stewart	Firestone	6	120	Willard	L-N.	Conn.	6	Haynes 46.	
Haynes 45	5	2485	127	34x4 1/2	31x45 1/4	3x3 1/2	Own	6	29.40	1 1/4-Ray.	Vacuum	Own	Own	Own	Own	Own	Stewart	Firestone	6	50	Gould	L-N.	K3-Ren	6	Haynes 45.	
Holler 206	5	1595	116	32x4	31x45 1/4	3x3 1/2	Cont.	8	25.35	Stew.	Vacuum	Own	Own	Own	Own	Own	Stewart	Firestone	6	60	Gould	A-C.	A-C.	6	Holler 206.	
Holler 198	5	1695	116	32x4	31x45 1/4	3x3 1/2	Own	8	33.80	Stew.	Vacuum	Own	Own	Own	Own	Own	Stewart	Firestone	6	60	Gould	A-C.	A-C.	6	Holler 198.	
Holmes	7	2900	126	34x4 1/2	31x45 1/4	3x3 1/2	Own	6	29.40	1-Newe.	Vacuum	Own	Own	Own	Own	Own	Stewart	Firestone	12	100	Col.	Split.	Split.	6	Holmes.	
Hudson M.	7	2400	126	34x4 1/2	31x45 1/4	3x3 1/2	Own	6	29.40	1-Newe.	Vacuum	Own	Own	Own	Own	Own	Stewart	Firestone	12	100	Col.	Split.	Split.	6	Hudson M.	
Hupmobile R.	5	1335	112	32x4	31x45 1/4	3x3 1/2	Own	4	16.90	1 1/4-Ström.	Vacuum	Own	Own	Own	Own	Own	Stewart	Kelsey	6	87 1/2	Willard	Delco	Delco	6	Holmes.	
Inter-State T.	5	1114	114	33x4	31x45 1/4	3x3 1/2	Own	4	19.60	1 1/4-Ström.	Vacuum	Own	Own	Own	Own	Own	Stewart	Firestone	6	87 1/2	Willard	West.	West.	6	Hupmobile R.	
Jackson.	5	1118	118	37x4	31x45 1/4	3x3 1/2	Own	8	28.80	Zen.	Vacuum	B. and B.	Covert	Arvae	Salisbury	Foster	Stewart	Firestone	6	120	Prest.	A-L.	A-L.	6	Jackson.	
Jones.	7	2100	125	32x4	31x45 1/4	3x3 1/2	Cont.	6	29.40	1 1/4-Ray.	Vacuum	B. and B.	B-L	Arvae	Timken	Warren	Stewart	Firestone	6	109.8	Willard	West.	West.	6	Jones.	
Jordan	7	2475	127	32x4 1/2	31x45 1/4	3x3 1/2	Cont.	6	29.40	1 1/4-Ström.	Vacuum	B. and B.	Detroit	Sterling	Timken	Genmer	Stewart	Firestone	6	109.8	Willard	Bijur	Bijur	6	Jordan.	
King G.	7	2150	120	34x4	31x45 1/4	3x3 1/2	Own	8	28.80	1 1/4-Ball	Vacuum	B. and B.	Own	Spicer	Col.	Jacob	Stewart	Stanweld	6	117.5	Willard	Bijur	Bijur	6	King G.	
Kissel Kar.	5-7	2550	124	32x4 1/2	31x45 1/4	3x3 1/2	Own	6	26.30	1 1/4-Ström.	Vacuum	Warner	Warner	Spicer	Own	Own	Stewart	Firestone	6	90	Willard	Remy	Remy	6	Kissel Kar.	
Kline Kar 6-42	5	1865	121	33x4	31x45 1/4	3x3 1/2	Cont.	6	25.35	1-Ray.	Vacuum	B. and B.	G-L	Spicer	Hess	Wohlbab	Stewart	Firestone	6	90	Prest.	West.	West.	6	Kline Kar 6-42.	
Lexington R-19	5-7	1785	122	34x4	31x45 1/4	3x3 1/2	Cont.	6	25.35	1-Ray.	Vacuum	B. and B.	Warner	Hardy	Hess	Warner	Stewart	Goodrich	6	100	Willard	West.	West.	6	Lexington R-19.	
Liberty 10-B	5	1570	115	32x4	31x45 1/4	3x3 1/2	Cont.	6	25.35	1-Ström.	Vacuum	B. and B.	Detroit	Spicer	Timken	Jacob	Stewart	Firestone	6	88	Willard	Delco	Delco	6	Liberty 10-B.	
Locomobile 48	7	142	142	35x5	41x55 1/2	4x6	Own	6	48.60	Own	Pressure	Own	Own	Own	Own	Own	Stewart	Firestone	6	120	Willard	West.	West.	6	Locomobile 48.	
Maibohm B.	5	1290	116	32x3 1/2	31x45 1/4	3x3 1/2	Falls	6	23.44	1-Ström.	Vacuum	B. and B.	Mechanics	Mechanics	Peru	Jacob	Stewart	Stanweld	6	80	Willard	Wagner	Wagner	6	Maibohm B.	
Marmon 34	7	3950	136	32x4 1/2	31x45 1/4	3x3 1/2	Own	6	33.75	Ström.	Gravity	Own	Own	Spicer	Own	Genmer	Stewart	Stanweld	6	120	Prest.	Bijur	Bijur	6	Marmon 34.	
Maxwell 25	5	805	108	30x3 1/2	31x45 1/4	3x3 1/2	Own	6	21.03	1-John.	Vacuum	Own	Own	Spicer	Own	Own	Stewart	Kelsey	12	35	Prest.	S-H.	S-H.	12	Maxwell 25.	
McFarlan 127	7	4300	136	35x5	41x55 1/2	4x6	Own	4	48.60	1 1/2-Ström.	Vacuum	B. and B.	B-L	Spicer	Timken	Genmer	Stewart	Firestone	6	120	Willard	West.	West.	6	McFarlan 127.	
Mercer Series 4	6	1500	132	32x4 1/2	31x45 1/4	3x3 1/2	Own	4	22.50	1 1/2-Ball	Vacuum	Own	Own	Spicer	Own	Own	Stewart	Firestone	6	120	Willard	West.	West.	6	Mercer Series 4.	
Mitchell C-42	7	1525	127	34x4	31x45 1/4	3x3 1/2	Own	6	29.40	1-Ray.	Vacuum	Own	Own	Spicer	Own	Own	Stewart	Firestone	6	100	Willard	Remy	Remy	6	Mitchell C-42.	
Mitchell D-40	5	1275	120	32x4	31x45 1/4	3x3 1/2	Own	6	25.35	1-Ray.	Vacuum	Own	Own	Spicer	Own	Own	Stewart	Firestone	6	100	Willard	Remy	Remy	6	Mitchell D-40.	
Moine-Knight L.	5	2000	117	34x4	31x45 1/4	3x3 1/2	Own	4	22.50	1 1/2-Schab.	Vacuum	B. and B.	Warner	Spicer	Timken	Jacob	Stewart	Firestone	6	117	Willard	Wagner	Wagner	6	Moine-Knight L.	
Moine-Knight G.	7	2500	122	35x4 1/2	31x45 1/4	3x3 1/2	Cont.	4	25.60	1 1/2-Schab.	Vacuum	B. and B.	Warner	Spicer	Timken	Jacob	Stewart	Firestone	6	117	Willard	Wagner	Wagner	6	Moine-Knight G.	
Monitor, M. & O.	5	1475	117	33x4	31x45 1/4	3x3 1/2	Cont.	6	29.40	1-Ström.	Vacuum	B. and B.	G-L	Arvae	Timken	C. A. S.	Stewart	Goodrich	6	88	Willard	Dyn.	Dyn.	6	Monitor, M. & O.	
Moone 6-66	7	2500	125	35x4 1/2	31x45 1/4	3x3 1/2	Cont.	6	19.84	1-Tillot.	Vacuum	B. and B.	Warner	Arvae	Timken	Warner	Stewart	Goodrich	6	110	Exide	Delco	Delco	6	Moone 6-66.	
Moone 6-36	5	1485	114	32x3 1/2	31x45 1/4	3x3 1/2	Cont.	6	19.84	1-Tillot.	Vacuum	B. and B.	Warner	Arvae	Timken	Warner	Stewart	Goodrich	6	110	Exide	Delco	Delco	6	Moone 6-36.	
Moore 30	5	1045	106	30x3 1/2	31x45 1/4	3x3 1/2	G. B. & S.	4	22.50	1-K. D.	Gravity	Own	G-L	Spicer	Peru	Warner	Stewart	Firestone	6	80	Willard	A-L.	A-L.	6	Moore 30.	
Nash 681	5	1490	121	33x4	31x45 1/4	3x3 1/2	Own	6	25.35	1 1/4-Mar.	Vacuum	B. and B.	Own	Own	Own	Genmer	Stewart	Firestone	6	100	Willard	Delco	Delco	6	Nash 681.	
Nash 682	7	1600	127	34x4 1/2	31x45 1/4	3x3 1/2	Own	6	25.35	1 1/4-Mar.	Vacuum	B. and B.	Own	Own	Own	Genmer	Stewart	Firestone	6	100	Willard	Delco	Delco	6	Nash 682.	
National Hy. 6	7	2450	128	34x4 1/2	31x45 1/4	3x3 1/2	Cont.	6	29.40	1-Ray.	Vacuum	Own	Muncie	Spicer	Col.	Warner	Stewart	Firestone	6	110	Prest.	West.	West.	6	National Hy. 6.	
National Hy. 12	7	3050	128	34x4 1/2	31x45 1/4	3x3 1/2	Own	12	39.08	1-Ray.	Vacuum	Own	Own	Spicer	Col.	Warner	Stewart	Firestone	6	110	Prest.	Bijur	Bijur	6	National Hy. 12.	
Oakland 34-B	5	1185	112	32x4	31x45 1/4	3x3 1/2	Own	6	18.99	1-Mar.	Vacuum	North.	Warner	Mechanics	West-Mott	Jacob	Stewart	Perman	6	85	Prest.	Remy	Remy	6	Oakland 34-B.	
Oldsmobile 37-A	5	1295	112	32x4	31x45 1/4	3x3 1/2	North.	6	18.99	1-John.	Vacuum	North.	Warner	Mechanics	West-Mott	Jacob	Stewart	Perman	6	80	U. S. L.	Remy	Remy	6	Oldsmobile 37-A.	
Oldsmobile 45-A	7	1700	120	34x4	31x45 1/4	3x3 1/2	Own	8	26.45	1 1/2-Ball	Vacuum	Own	North.	Perman	West-Mott	Jacob	Stewart	Perman	6	100	Exide	Delco	Delco	6	Oldsmobile 45-A.	
Olympian 45	5	1240	112	32x3 1/2	31x45 1/4	3x3 1/2	Own	4	16.90	1-Ray.	Vacuum	B. and B.	Own	Perman	Perman	Warner	Stewart	Perman	6	100	Exide	Delco	Delco	6	Olympian 45.	
Overland 90	5	985	106	31x4	31x45 1/4	3x3 1/2	Own	4	18.23	1-Tillot.	Vacuum	Own	Own	Own	Own	Own	Stewart	Stanweld	6	75	U. S. L.	A-L.	A-L.	6	Overland 90.	
Owen Magnetic O-36	7	4200	142	35x5	41x55 1/2	4x6	Own	6	25.35	Zen.	Vacuum	none	Own	Spicer	Amer.	Own	Warner	Stanweld	24	Willard	Willard	Own	Own	24	Owen Magnetic O-36.	
Owen Magnetic W-42	7	5500	142	35x5	41x55 1/2	4x6	Weid.	6	38.40	Zen.	Vacuum	none	Own	Spicer	Amer.	Own	Warner	Stanweld	24	Willard	Willard	Own	Own	24	Owen Magnetic W-42.	

Engines—Ruten, Rutenber; Cont., Continental; Weid., Weidely; North, Northway; H-S, Herschell-Spillman; Lycoo, Lycoming; D-Lycoo, Dort-Lycoming; G. B. & S., Golden, Balknap & Swartz; T-McF., Tector-McFarlan; #, Monson or Duesenberg; R. & V., Root & Van Dervoort. Carburetor—Strom, Stromberg; Zen., Zenith; Ray, Rayfield; John, Johnson; Mar., Marvel; Sund., Sunderman; Stew., Stewart; H-K, Holly-Kingsdon; Newc., Newcomb; Schab., Schaeber; Tiltot., Tiltotson; Johns., Johnston. Ignition—A-K, Atwater-Kent; Conn., Connecticut; Else., Essensman; West., Westinghouse; Will., Willard; N. E., North East; K-Remy, Kingston-Remy; Berl., Berling; Bosch-W., Bosch-Westinghouse; Split., Splittorf; S-N, Simms-Huff; G. & D., Gray & Davis. Generator and Motor—Columbia, W. V. Weiss, Walker-Weiss; C-Tmk., Cadillac-Timken; West-Mott, Weston-Mott. Universals—Hart., Hartford; Ther-H., Thermoid-Hardy; U. M. Co., Universal Machine Co., Speedometer—J-Man, Johns-Manville; V-Sicklen, Van Sicklen. Tires—



# Motor Age Monthly Passenger Car Specification Tables—Concluded

Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. HP.	Carburetor Make and Size	Fuel Feed	Clutch	Gearset	Universals	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages	Name and Model
Packard 3-25	7	4800	120	35x5	Goodyear	3 1/2 x 5 1/2	Own	12	13-20	Own	Pressure	Own	Own	Spicer	Own	Own	Walham	Freestone	6	120	Willard	Blur	Blur	Delco	7	Packard 3-25
Packard 3-35	7	5150	120	35x5	Goodyear	3 1/2 x 5 1/2	Own	12	13-20	Own	Pressure	Own	Own	Spicer	Own	Own	Walham	Freestone	6	120	Willard	Blur	Blur	Delco	7	Packard 3-35
Paige 6-55	7	2060	127	34x4	optional	3 1/2 x 5 1/2	Cont.	6	29-40 1/2	Ray	Vacuum	B. and B.	Own	Spicer	Salisbury	Jacob	Stewart	Kelsey	6	108.4	Willard	Remy	Remy	Delco	6	Paige 6-55
Paige 6-39	5	1555	117	33x4	optional	3 1/2 x 5	Ruten.	6	23-44	1-Ray	Gravity	B. and B.	Own	Spicer	Salisbury	Jacob	Stewart	Kelsey	6	108.4	Willard	Remy	Remy	Delco	6	Paige 6-39
Peterson 6-46	7	1625	120	33x4	Goodyear	3 1/2 x 5 1/2	Cont.	6	25-35 1/2	Strom.	Vacuum	B. and B.	Own	Harford	Hess	Jacob	Stewart	Freestone	12	125	Willard	Delco	Delco	Delco	6	Peterson 6-46
Peterson Series 4	7	2760	125	35x4	Goodyear	3 1/2 x 5	Own	8	33-80	Ball	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Stanwell	6	125	Willard	A-L	A-L	A-K	6	Peterson Series 4
Phauma L.	5	5000	128	32x4	U. S.	3 1/2 x 6	Own	4	24-70 1/2	H. & N.	Vacuum	Own	Own	Spicer	Amer.	Own	Warner	Freestone	6	125	Willard	W-L	W-L	Bosch	6	Phauma L.
Piedmont	5	1095	114	32x3	Goodyear	3 1/2 x 5 1/2	Own	4	19-60	Carier	Vacuum	Own	Own	Spicer	Tinklen	Own	Warner	Freestone	6	125	Willard	W-L	W-L	Bosch	6	Piedmont
Piedmont 6-40	5	1545	120	32x4	Goodyear	3 1/2 x 5 1/2	Cont.	6	25-35	Zen.	Vacuum	B. and B.	Own	Spicer	Tinklen	Own	Warner	Freestone	6	135	Willard	Remy	Remy	Delco	6	Piedmont 6-40
Pierce-Arrow 48	7	6500	142	35x5	Goodyear	4 1/2 x 5 1/2	Own	6	48-60	Own	Pressure	Own	Own	Hart	Hess	Own	Stewart	Goodrich	6	135	Willard	West.	West.	Delco	6	Pierce-Arrow 48
Pilot	7	119	119	32x4	Miller	3 1/2 x 5	Tector	6	23-44 1/2	Tillot.	Vacuum	B. and B.	Own	Spicer	Tinklen	Warner	Warner	Freestone	6	123.5	Willard	Delco	Delco	Delco	6	Pilot
Premier 6-C	7	2585	126	32x4	Freestone	3 1/2 x 5 1/2	Own	6	27-34 1/2	Johns.	Vacuum	B. and B.	Own	Spicer	Tinklen	Own	Warner	Freestone	6	123.5	Willard	Delco	Delco	Delco	6	Premier 6-C
Reo T.	5	1395	120	34x4	U. S.	4 1/2 x 4 1/2	Own	4	27-23	1-John.	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	6	108.5	Willard	Remy	Remy	Remy	6	Reo T.
Revere	7	385	131	32x4	optional	4 1/2 x 6	Cont.	4	30-63 1/2	Strom.	Vacuum	B-L	B-L-Mun.	Arvae	Hess	Own	Stewart	Houk	6	120	Willard	N. E.	N. E.	Bosch	6	Revere
Roamer 6-54	7	128	128	32x4	Goodyear	3 1/2 x 5 1/2	Cont.	6	29-40 1/2	Strom.	Vacuum	B. and B.	Own	Arvae	Hess	Own	Warner	Freestone	6	115	Willard	Blur	Blur	Bosch	6	Roamer 6-54
Saxon Y-18	5	1195	112	32x3	Goodyear	2 7/8 x 4 1/2	Cont.	6	19-84	1-Strom.	Vacuum	Own	Own	Spicer	Tinklen	Warner	Stewart	Freestone	6	60	Prent.	Wagner	Wagner	Remy	6	Saxon Y-18
Sayers, A.	5	118	118	32x4	Goodyear	3 1/2 x 4 1/2	Own	6	29-40	Zen.	Vacuum	North.	Warner	Warner	West-Mott	J. C. W.	Stewart	Perleman	6	85	Prent.	Remy	Remy	Remy	6	Sayers, A.
Scripture-Booth 6-39	5	1205	112	32x4	Goodyear	2 1/8 x 4 1/2	North.	6	25-19	1-Mar.	Vacuum	Detroit	Detroit	U. M. Co.	Adams	Own	Stewart	Prudden	6	88	Willard	A-C	A-C	Remy	6	Scripture-Booth 6-39
Stanca H.	5	900	108	30x3	optional	3 1/2 x 4 1/2	LeRo	4	15-63	1-Schub.	Vacuum	Detroit	Detroit	U. M. Co.	Adams	Own	Stewart	Prudden	6	88	Willard	A-C	A-C	Remy	6	Stanca H.
Singer, 19	7	5000	139	35x5	Goodyear	4 x 5 1/2	H-S	6	33-80 1/2	Ray	Vacuum	Muncie	Muncie	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Singer, 19
Standard G.	7	2750	127	34x4	Freestone	3 1/2 x 5	Own	4	22-50 1/2	Schub.	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Standard G.
Stearns SKI-4	5	2100	125	34x4	Goodyear	3 1/2 x 5 1/2	Own	6	25-35 1/2	Strom.	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Stearns SKI-4
Stephens 76	6	1850	118	32x4	optional	3 1/2 x 4 1/2	R. & V.	6	36-04 1/2	Ball	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Stephens 76
Studebaker EG	7	1985	126	32x4	Goodyear	3 1/2 x 5	Own	6	29-40 1/2	Ball	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Studebaker EG
Studebaker EH	5	1585	119	32x4	Goodyear	3 1/2 x 5	Own	6	29-40 1/2	Ball	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Studebaker EH
Studebaker SH	5	1125	112	32x3	Goodyear	3 1/2 x 5	Own	4	19-60 1/2	Schub.	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Studebaker SH
Stutz G.	6-7	2550	130	32x4	Goodyear	4 1/2 x 6	Own	4	30-63	Strom.	Pressure	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Stutz G.
Templar 445	5	2185	118	32x4	Templar	3 1/2 x 5 1/2	Own	4	18-23 1/2	Zen.	Vacuum	B. and B.	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Templar 445
Tulsa, D.	5	1150	117	33x4	optional	4 x 3 1/2	Lyco.	4	19-60 1/2	Zen.	Vacuum	B. and B.	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Tulsa, D.
Vellie 38	5	1540	115	32x4	Goodyear	3 1/2 x 4 1/2	Cont.	6	25-35 1/2	Ray	Vacuum	B. and B.	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Vellie 38
Westcott S-18A	7	2590	125	32x4	Freestone	3 1/2 x 5 1/2	Cont.	6	29-40 1/2	Ray	Vacuum	B-L, Warn.	B-L, Warn.	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Westcott S-18A
Willys-Knight 88-4	7	1725	121	34x4	optional	4 1/2 x 4 1/2	Own	4	27-23 1/2	Tillot.	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Willys-Knight 88-4
Winton 22	7	3850	138	35x5	optional	4 1/2 x 5 1/2	Own	6	48-60 1/2	Ray	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Winton 22
Winton 22-A	7	3200	128	35x5	optional	3 1/2 x 5 1/2	Own	6	53-75 1/2	Ray	Vacuum	Own	Own	Spicer	Tinklen	Own	Stewart	Freestone	12	75	Willard	West.	West.	Split.	6	Winton 22-A

## STEAM CARS

Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. HP.	Carburetor Make and Size	Fuel Feed	Clutch	Gearset	Universals	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages	Name and Model
Stanley 735	7	3150	130	35x4	optional	4 x 5	Own	2	...	none	none	none	none	none	Own	Warner	Warner	Freestone	6	...	Willard	Remy	none	none	6	Stanley 735

Engines—Ruten; Cont., Continental; Weil, Weidely; North, Northway; H-S, Herschell-Spillman; Lyco, Lycoming; D-Lyco, Dort-Lycoming; G. B. & S., Golden, Balknap & Seartz; T-Mof., Tector-Melarian; S., Monson or Duesenberg; R. & V., Root & Van Dervoort, Carburetor—Strom, Stromberg; Zen, Zenith; Ray, Rayfield; John, Johnson; Mar, Marvel; Sund, Sunderman; Stew, Stewart; H-K, Holley-Kingston; Newc, Newcomb; Schab, Schieber; Tillot, Tillotson; Johns, Johnston. Generator and Motor—A-L, Auto-Lite; West, Westinghouse; W., Westinghouse or Auto-Lite; W-L, Ward Leonard; Dym, Dymco; N. E., North East; L-N, Leece-Neville; A-C, Allis-Chalmers; Split, Splittorf; S-N, Simms-Huff; G. & D., Gray & Davis. Ignition—A-K, Alwater-Krit; Conn., Connecticut; Eise, Eisenmann; West, Westinghouse; Will, Willard; N. E., North East; K-Remy, Kingston-Remy; Berl, Berling; Bosch-W, Bosch-Westinghouse; Split, Splittorf. Gearset—G-L, Grant-Lees; North, Northway; B-L, Brown-Lipe. Rear Axle—Col., Columbus; W-Weiss, Walker-Weiss; C-Timk., Cadillac-Timken; West-Mott, Weston-Mott; West-Mott, Weston-Mott; Thier-H., Thermo-Hardy; U. M. Co., Universal Machine Co. Speedometer—J-Man, Johns-Mansville; V-Sicken, Van Sicken. Tires—





Two views of Stutz car with front wheel brakes in addition to conventional rear brakes. Pressure is equalized on all four wheels

## Four-Wheel Brake System

Quick Stops and Elimination of Skidding Danger

THE four-wheel hydraulic system of braking has been designed to eliminate skidding on slippery streets aside from acting as a powerful means to bring a motor vehicle to a quick stop when traveling fast. Tests in Chicago with a Stutz car so equipped have shown it possible to stop the car within 31 ft. traveling 35 m.p.h. The Earl P. Cooper Co., Los Angeles, Cal., controls the manufacturing rights of this brake, the middle west section, however, having been turned over to the Four Wheel Brake Co., 4411 Drexel boulevard, Chicago.

The operation is essentially the same as the conventional type, the stopping of the car being directly proportional to the amount of pressure used on the pedal. When installing these brakes, they take the part of the foot brake only, the emergency brake being left on the car to be able to lock the car on a grade. Burning up brake lining is prevented inasmuch as the braking surface is doubled with equal distribution of the braking force. Also, there is no need for using the engine as a brake. At least 25 per cent, it is said, is added to

the life of the tires by the four-wheel brake installation.

The makers state that one of the most important features of these brakes is the fact that regardless of the adjustment on the bands the pressure is exactly the same on each wheel when the brake pedal is applied. The system consists of five cylinders with a piston inside of each, one cylinder being riveted to each of the four brake bands. The fifth cylinder, which is a little longer than the others, is bolted under the car in such a position that the rod which connects the brake pedal will operate the piston of this fifth cylinder.

There are four 1/8-in. steel pipes running from this cylinder to the frame opposite each wheel. A flexible hose screws onto each of these pipe ends, the other ends of the hoses connecting to each of the four brake-band cylinders. The pipes, hoses and cylinders are filled with a non-freezing oil, and when the foot pedal is applied a pressure is created in the line, moving each of the four brake-band pistons, and these are connected in such a way to the bands that the bands are contracted on the drums

when the pressure is applied. There is no pressure on the pipe line, except when the brake is used. Only one valve is necessary and this is used only when filling the line.

Owing to the equalization of the braking force applied to the front wheels and placing the brake drum in the correct position in relation to the knuckle pin, there is no interference with steering the car.

A further feature of this system is that the adjustment of the brakes is not disturbed with any change in the load carried. This is caused in some cases of conventional design by the action of the springs changing relationship of the rear axle to the frame, thereby shortening or lengthening the distance between the foot pedal and the rear axle.

### 150 MAXWELLS A DAY

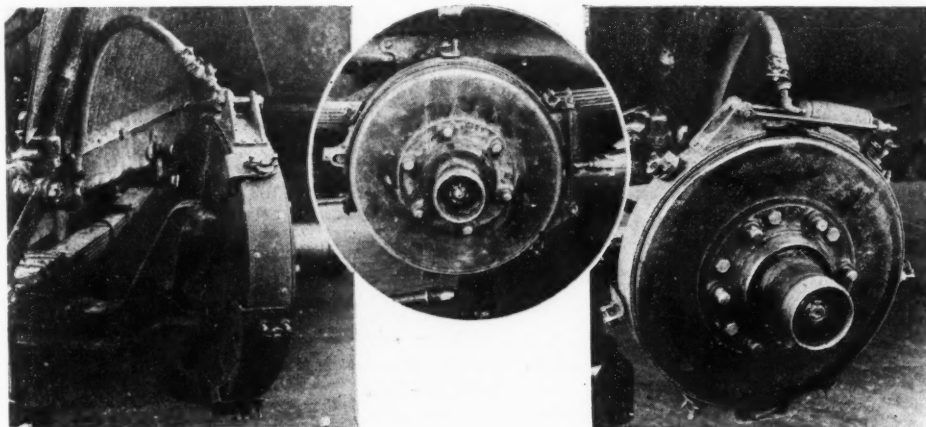
Detroit, Jan. 31—The Maxwell Motor Car Co. is now producing 150 cars daily and expects to increase this output materially in the immediate future.

### DORT NORMAL AGAIN

Flint, Mich., Jan. 31—The Dort Motor Car Co. has about finished Government work and is back at normal passenger car production again. The plant is turning out forty cars daily, and its 1919 production schedule calls for 15,000 machines. The next three or four weeks will see the last Government job completed. This winds up over \$3,000,000 of war contract work which called for the manufacture of AA trucks, trailers, truck C bodies and cutting boards.

### RECEIVER FOR HURLBURT TRUCK

New York, Jan. 31—The Hurlburt Motor Truck Co. is in the hands of a receiver. William B. Hurlburt has been appointed receiver by the United States District Court under bond of \$25,000. The company claims assets of about \$500,000 and liabilities of about the same amount.

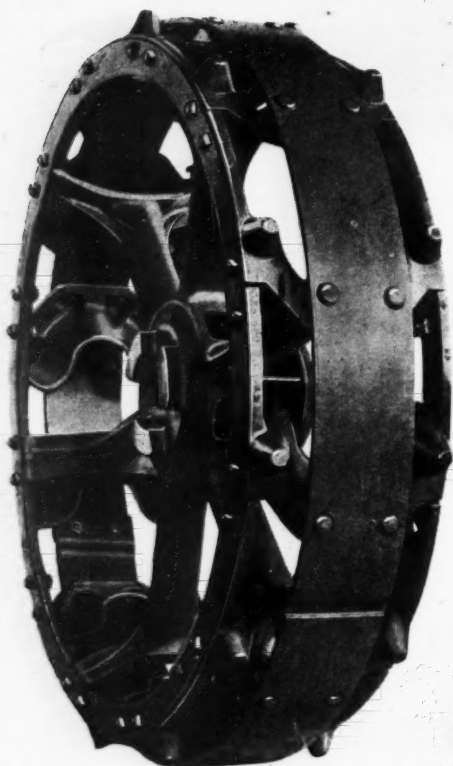


Views of four-wheel brake system, showing hose which conveys the non-freezing oil to the cylinders on brake bands



# Mastodon Is Model for Tractor Wheel

## Hoofs of Animal Reproduced in Metal



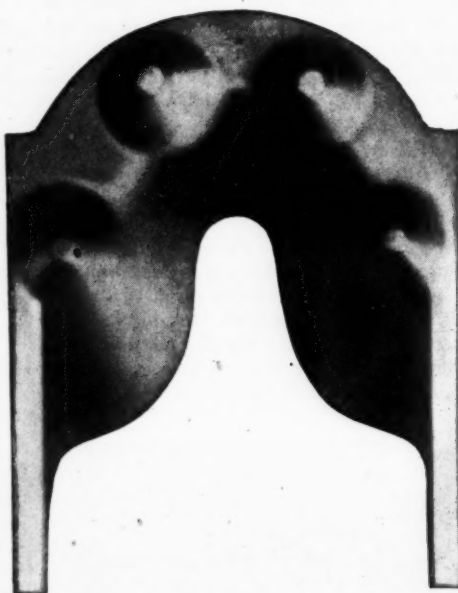
Details of the Mastodon tractor wheel, showing it at left with band for road

THE Standard Steel Castings Co., Cleveland, Ohio, and Chicago, which operates two foundries in these cities, has acquired the sales and manufacturing rights for the Mastodon tractor treads from the United States Traction Wheel Co. This wheel is distinctly different from what commonly are termed open-faced wheels. It is made of several peculiarly-shaped hoofs, which have toes and inwardly curved flanges which compress the soil for the moment and then loosen it up as the wheel moves forward. The slanting, self-cleaning treads act as a horse's hoof and get a toe hold in any kind of soil. As the hoof moves forward it gets a new base for traction.

### Tests of Wheel

The wheel has been tested under various conditions. The idea for it is derived from the mastodon, the American animal that most closely approaches a tractor in weight and slow movements over varied soils. It was from a study of the mastodon's hoof with certain modifications suggested by definite knowledge of the tractor needs that the Mastodon tractor wheel was designed. Its success in getting traction without creeping backward when under a load and its self-cleaning qualities, which cause it to keep on getting this firm foothold in any kind of soil, are two features emphasized strongly from the standpoint of tractor users.

The wheel has openings at the rear of each sloping hoof. There are no angles at any point in the tread, but all surfaces are smooth and round so that clogging is prevented, and even should soil cling to the wheel when it revolves it is pressed out



The sloping hoof which the Mastodon wheel employs in its makeup

through the openings as the tread, revolving, comes in contact with the ground.

The bearing surface is not reduced, even though it is an open-faced wheel. The spuds and curved flanges, if flattened, would more than fill up the openings between each hoof. Just as the mastodon walked on four feet, four of the hoofs on the wheel are on the ground at the same time. A road band which can be put on or taken off in 10 min.

makes the Mastodon suitable for driving over improved roads.

The officers of the Standard Steel Castings Co. are: President, Julius F. Janes; vice-president and treasurer, Edwin H. Janes, and secretary, J. G. Fogg. The company has built up a large business of miscellaneous castings of electric and converter steel. It also has been manufacturing cast-steel motor truck wheels for some time and has a complete electric steel foundry and machine shop in Chicago, specially equipped for the manufacture of this product, with a capacity of 500 sets of these wheels a day.

## Bailor Motorizes Its Cultivator for Trade

THE new Bailor motor cultivator, which was shown to the public the first time in Convention Hall at Kansas City during the recent convention of the Western Retail Implement, Vehicle & Hardware Association, is composed of standard units throughout. In fact, it is just the well-known, established Bailor two-row horse-drawn cultivator motorized, and motorized by an assembly of standard units.

The engine is a four-cylinder, vertical Le Roi, with  $3\frac{1}{2}$  in. bore and  $4\frac{1}{2}$  in. stroke. The carburetor is optional, Holley or Kingston, with a Bennett air cleaner as regular equipment. Ignition is by Dixie high-tension magneto. A Perfex radiator with water gage is standard part of the cooling system.

The clutch is a 10-in. dry-plate Borg & Beck, and the transmission is ordinary type of sliding gear, self-contained with jackshaft and roller bearings. The gear-set is entirely inclosed and runs in oil. Final drive is chain from jackshaft to driving axles.

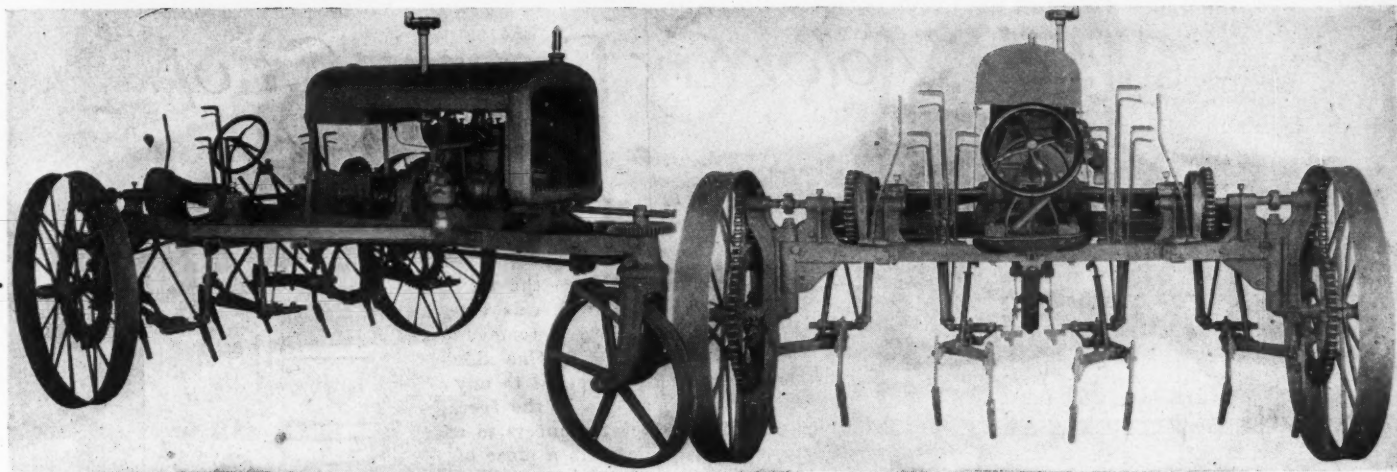
The cultivator has no pulley, as it is the idea of the manufacturers that a motor cultivator should not be used for belt work.

### Parts Are Accessible

Accessibility to all parts has been given particular attention, and as a result every part of the engine and gearset can be reached readily. This fact, coupled with the employment of standard parts only in the assembly, makes the repair of the cultivator by the farmer entirely feasible.

The cultivator has a feature deserving of particular mention. This is that the operator can control the cultivator from the two driving wheels. The guiding device is constructed with brakes on each side of the differential, permitting the locking of either drive wheel while the other continues to travel. This makes it possible to turn the cultivator in a perfect circle, the machine pivoting on the locked wheel. This is an advantage at the end of the rows, as it is possible to turn the cultivator so short that it can be started back in the two rows next to those just cultivated. The machine drives through universal joints, permitting the operator





Two views of the Bailor motor cultivator, which is composed of standard units. Control is from the two driving wheels, and accessibility of parts is stressed

to control the beams with his feet, an advantage when the rows happen to be crooked.

A small cultivator, one-row, for use in

the cotton fields of the south, fitted with a two-cylinder Cushman engine, with 4-in. bore and 4-in. stroke, is just ready. The first model of this type completed was

shown at the Kansas City convention also.

The price for either model has not as yet been announced, but it will be easily within the reach of the average farmer.

## Af-Ford-Able Truck Attachment

It is claimed for the truck attachment made by the Af-Ford-Able Motor Truck Corp., Omaha, Neb., that it not only strengthens the Ford car to which it is attached but that the arrangement of the bearings makes the entire pulling power of the engine available. The attachment is designed to convert a Ford car into a motor truck with a capacity of 1 ton.

### Dimensions of Frame

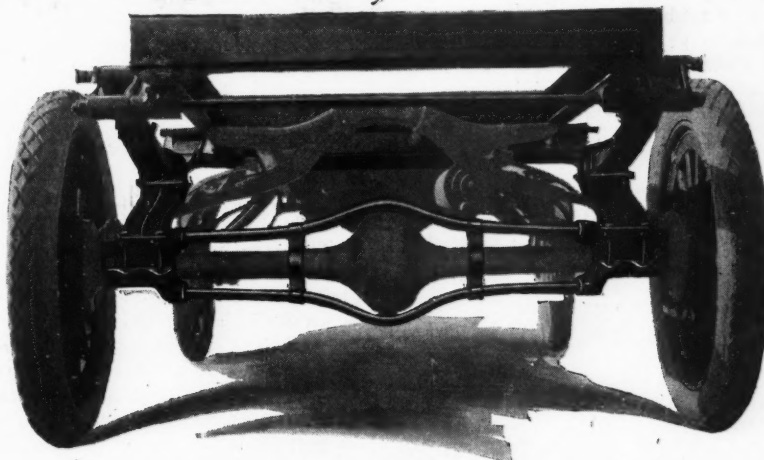
The frame is 9 ft. 5 in. long and extends back from the dash  $3\frac{1}{2}$  ft. beyond the regular frame. It is bolted to the top of the Ford frame, strengthening it. The brackets fit the body holes, so that it is unnecessary to bore any holes in the original frame. The truck frame affords a long loading space behind the driver's seat. The dimensions of the attachment are shown in the accompanying illustration.

The attachment has a brace extending across the top and bottom of the rear axle housing. This is clamped rigidly at both ends and in the center. It is claimed this prevents the breaking of the rear axle housing, keeps the wheels from spreading and maintains the axle in exact position.

The bearings used in the attachment are roller placed inside the hub and rotating on the outside of the rear axle housing of the Ford. This provides a double set of bearings and, it is claimed, makes possible the

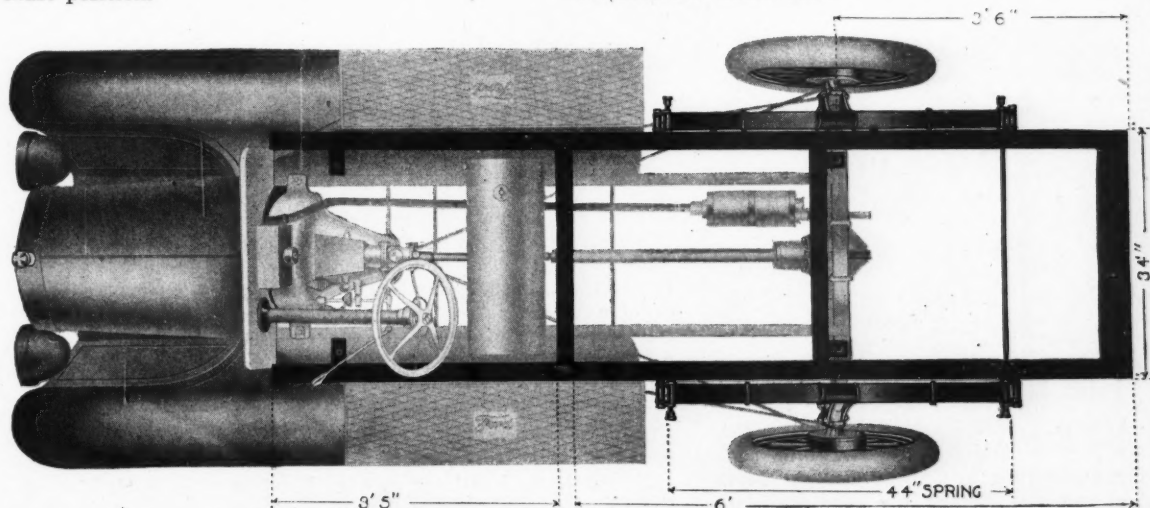
utilization of more of the power of the engine.

The two wheels which go with the attachment are made of wood, with demountable rims and heavy brake drums.



Brace for the rear axle of the Ford car used with the Af-Ford-Able attachment

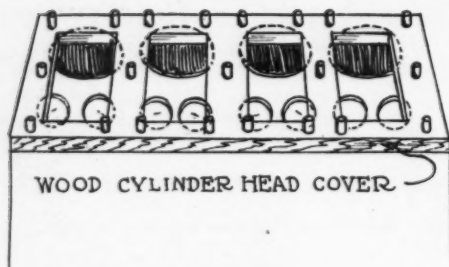
Frame of the Af-Ford-Able truck attachment, showing manner of attaching to the Ford and giving dimensions





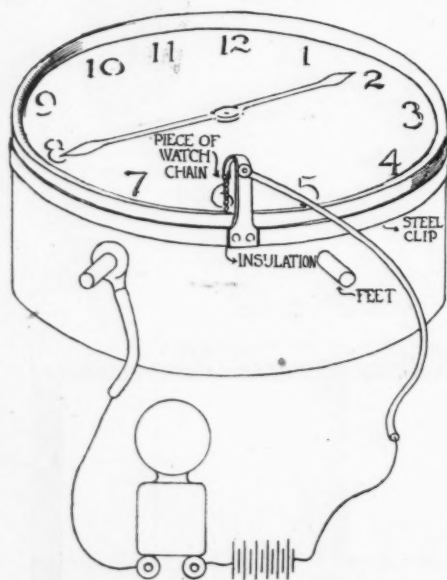
# The Motor Car Repair Shop

## Practical Maintenance Hints



### Wooden Cylinder Protector

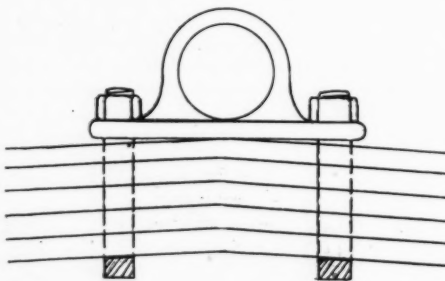
When a cylinder head is removed there is danger of carbon particles and other undesirable foreign matter dropping into the waterjackets. To prevent this, careful repairmen are beginning to use various means for covering or closing the holes. Some use wooden pegs, but a better method is to employ a wooden board about  $\frac{1}{2}$  in. thick. This board is roughly cut away to give access to the combustion chamber openings and holes must be drilled to allow the cylinder studs to pass through. When this is put in place it closes up the waterjacket spaces and any stud holes which are open. A still better method is to take an old gasket designed for the particular engine in hand, and solder sheet metal over the waterjacket openings. Obviously, the advantage in using a gasket is that it is cut to fit, takes up little space and is easy to handle.



### Electric Alarm Clock

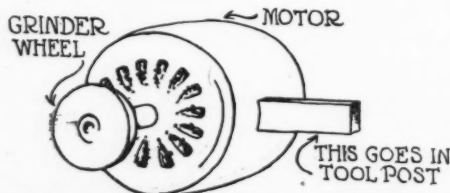
An alarm clock may be modified so that it will close a circuit at any given time, ring an electric bell or, by a slight deviation from the sketch, ring bells at successive intervals. The latter, for example,

might be used in announcing to the man when certain tires and tubes he was vulcanizing are done. The glass is removed from an ordinary alarm clock. One side of the electric circuit is connected to any convenient point, such as one of the feet. The other side of the circuit connects to a curved arm which terminates in a piece of watch chain. This arm is insulated from the snap clip on which it is mounted and which extends around the clock. It may be placed in any position on the circumference so that when the minute hand reaches this point the circuit is completed through the watch chain and the circuit is closed. By using adjustable arms on the same clip several circuits might be operated in succession so that for a given tire job, for example, the clock might be set to ring at 2, 2:40, 3:05 and 5:15.



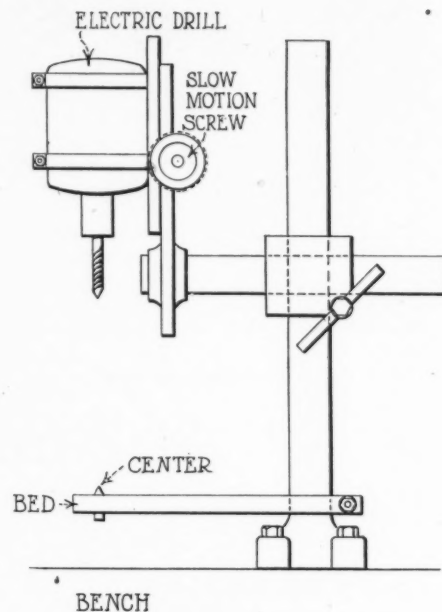
### Prevent Spring Breakage

The fracturing of a spring leaf in the region of the clips is usually due to loose spring clips. This allows the spring leaves to weave up and down under the clips with the result that sooner or later a leaf is strained so that it breaks. The remedy is to tighten the spring clip nuts as soon as they become loose; hence, the necessity for inspecting them every few weeks.



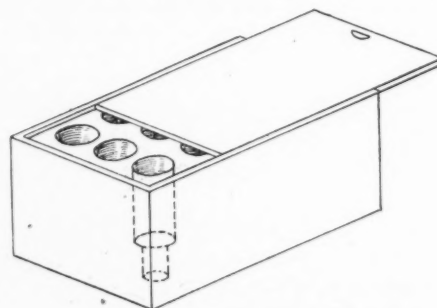
### Valve Refacers

With the advent of tungsten steel and other hard-alloy valves repairmen all over the country tried various schemes for refacing them, but an examination of all the different methods forces the conclusion that there are only two that are particularly worth recommending. One is the use of some special valve-refacing tool made for the purpose, and the other is the use of a portable electric grinder designed to be mounted in the tool post of a lathe. The valve is chucked and the grinder is set in the tool post with its wheel at an angle of 45 deg.



### Electric Bench Drill

The electric drill may be used in lieu of a drill press by mounting it in a stand as shown. Such a stand may be made or purchased. The drill motor is clamped in a vertical position and is fed down to the work by the action of a handle which operates a slow-motion screw. This mechanism is attached to a horizontal pillar, which in turn is carried on a vertical pillar, the two being held together, as well as relative adjustment between them obtained, by a block which clamps both pillars at once. The whole mechanism may be mounted on the workbench. There is a bed for supporting the work, and by providing it with a center it is possible to chuck a valve which then may be trued up with a file.



### Spark Plug Container

A container for spark plugs is a worthwhile protection for spark plugs which have been removed from an engine during the process of overhauling. The container shown consists of a box with a sliding cover into which has been inserted a built-up block of wood which completely fills the box. The block is bored with twelve holes just large enough to receive the porcelain.



# The Accessory Corner

## New Fitments for the Car

### Drake Hydroscope

THE hydroscope made by the Drake Mfg. Co., Milwaukee, Wis., gives visual evidence that the cooling water is circulating, because as long as it is circulating a small fountain of water is maintained in the hydroscope, and as soon as the water ceases circulating the fountain stops. The device is made in two styles, model C being mounted on the filler cap of the radiator and model B being arranged to fit on the dash and having a small electric light so the fountain can be seen easily at night.

### Se-Ment-Ol

Se-Ment-Ol is a radiator cement in both powder and liquid form and is made by the Northwestern Chemical Co., Marietta, Ohio. The liquid comes ready for use in the radiator without losing any time whatsoever. The water in circulating through the cooling system carries Se-Ment-Ol to the leak and, on coming in contact with the air it congeals and is hardened by the heat of the engine, forming an elastic repair which cannot be destroyed by the action of the water or the vibration of the car, it is said. The directions state it is not necessary to drain the radiator and that it will repair automatically any new leaks that may develop when allowed to remain in the radiator. A 75-cent can will repair a radiator holding 6 gal. of water.

### Arc-O-Fire Plug

W. O. Olsen of the Marmon-Chicago Co. has spent several years experimenting with spark plugs, and has produced one of original design. It is a petticoat-type plug with distinctly different electrodes. The temperature within the cylinder, which varies, causes the spark to flutter up and down, and it thus comes into contact with greater portions of the vapor. The electrodes are made from an alloy of manganese

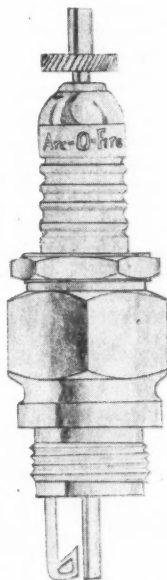
and nickel capable of withstanding very high temperatures, it is said. These high temperatures are the means that keep the plug free from carbon and oil, eliminating trouble due to fouling. This plug is being manufactured by the Marmon-Chicago Co., Chicago, and is called the Arc-O-Fire.

### New Schebler Carbureter

The new Schebler plain-tube carbureter is now on the market for use in motor cars. This carbureter was developed for the Government in war machines and was tested and tried under the most exacting laboratory conditions and then the various war machines were equipped with these carbureters and improvements suggested by the trying conditions of war were made.

The pivot-tube principle is employed, and

the differential head, which is secured from the difference in pressure of an upstream current and a downstream current, is the means of supplying and regulating the fuel. Two adjustments are supplied for regulating, B for low speed and A for high speed. C is a dash adjustment for warming up the engine. This dash control cannot be referred to as a choke, because it does not restrict the air in the sense that it allows a charge of raw gasoline to be drawn into the cylinder. A denser mixture of gasoline, still thoroughly atomized, is the result of using this dash control, which is an improvement because no liquid gasoline is then present to drain down into the crankcase and dilute the lubricating oil. This is the model A Schebler vertical type and is being made in six sizes, ranging from 1 in. to 2 1/4 in. in diameter.



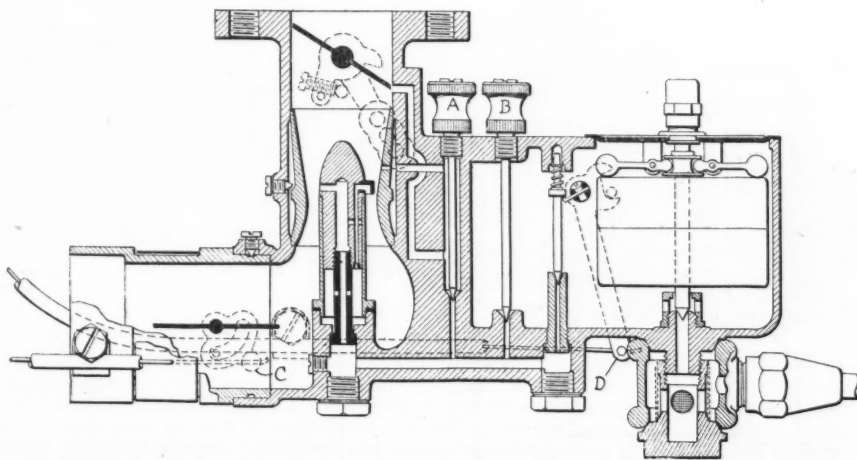
Arc-O-Fire spark plug made by Chicago dealer

### Van Sicklen Additions

The Van Sicklen chronometric tachometer was designed by that company for the Government in airplane use. It was used on Government airplanes and by Ford, Lincoln, Cadillac and Marmon on their Liberty-engine testing stands. It is a speed-measuring instrument of precision whose readings are intermittent and checked every second; it measures shaft speeds in r.p.m. and surface speeds in linear feet. This concern has brought out a new mechanically-wound speedometer and watch combination also. The feature of this instrument is that by driving the car 3 miles during a period of eight days the watch unit will be rewound for eight more days. If the car is not driven at all for eight days the watch will keep perfect time. Another addition to the Van Sicklen line is a truck hub odometer.

### New Demountable Rim

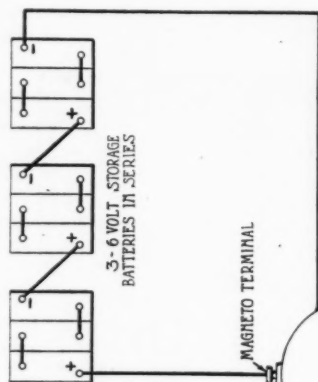
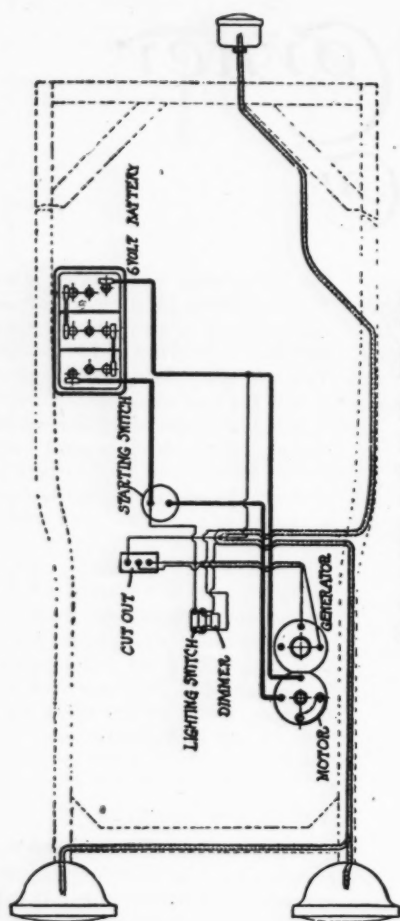
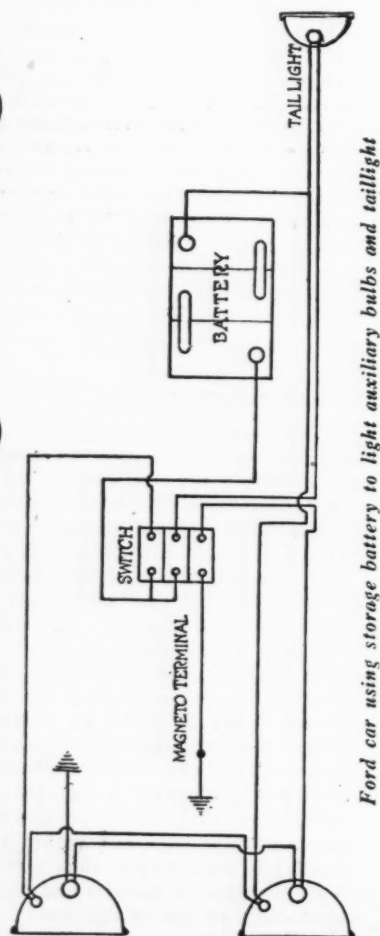
The new interchangeable features adopted by makers with the characteristics of Stanweld rim construction are embodied in the standardized demountable rim just placed on the market by the Standard Parts Co., Cleveland, Ohio. A locking device, ease of manipulation, light weight, strength and uniformity and smoothness of finish are features of this rim. The driving stud, which is interchangeable on all standardized rims, is separated from the locking parts, and the opening of the rim is removed from the point at which the tire valve stem penetrates the rim, eliminating the danger of the valve stem threads being damaged as the rim is operated. Another distinctive feature is the permanent attachment of the wedge nut within the wedge itself. This permits of more rapid removal or application of the rim and obviates the possibility of the wedge nuts being misplaced or lost.



Cross-section of new Schebler carburetor, developed for Government use in war and now on general market



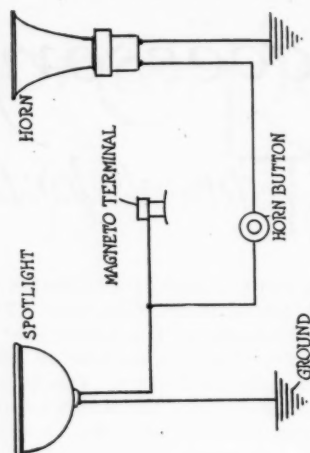
# Motor Age Wiring Diagram Chart No. 14



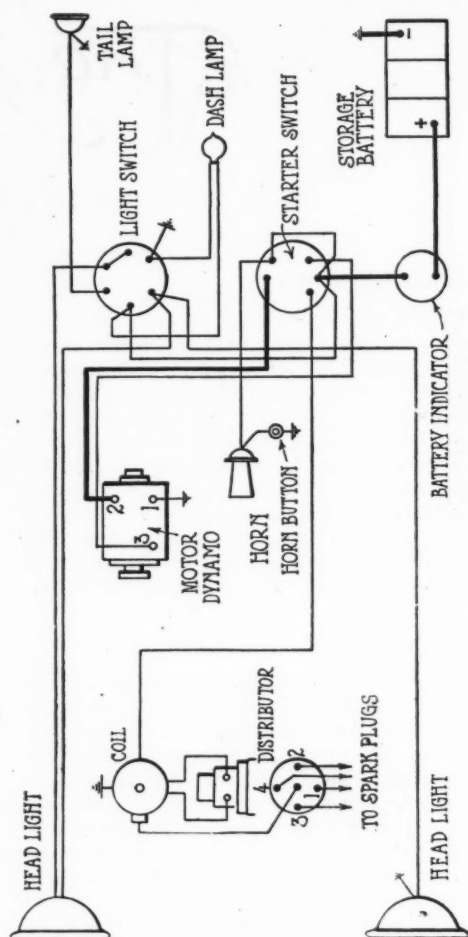
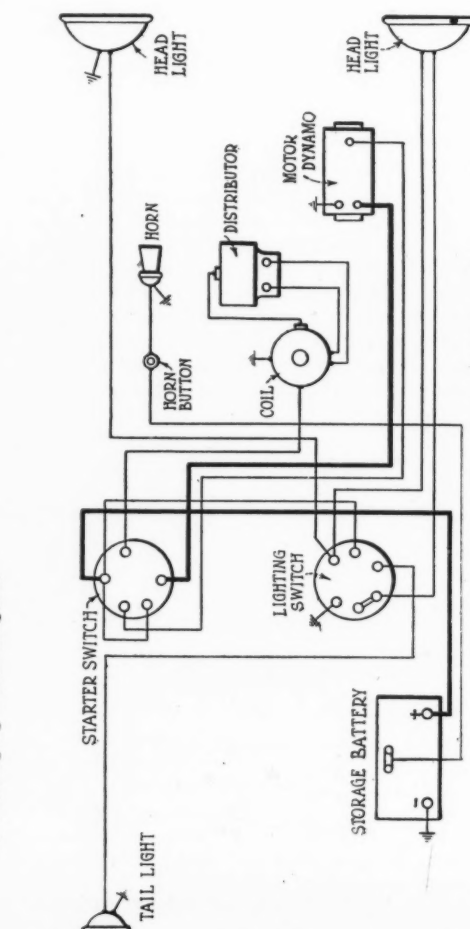
Alter—Nov. 14  
 Buick—Nov. 21  
 Cadillac—Dec. 19  
 Chevrolet—Nov. 28  
 Cole—Jan. 23  
 Dodge Brothers—Dec. 12

Ford—Jan. 30  
 Hudson—Dec. 5  
 Locomobile—Jan. 23  
 Marmon—Dec. 9  
 Maxwell—Dec. 16  
 Mercer—Jan. 23

Mitchell—Jan. 9  
 Oakland—Jan. 2  
 Oldsmobile—Jan. 23  
 Overland—Nov. 7-14  
 Scripps-Booth—Dec. 26  
 Studebaker—Dec. 26



Connections for installing horn on Fords





# Among the Makers and Dealers

## Short Trade Notes

**RIPLEY is Promoted by Fisk**—J. P. Ripley, for seven years manager of the Baltimore, Md., branch of the Fisk Rubber Co., has left to become superintendent of the central district of the Fisk company, comprising twenty-two branches. E. J. McLaughlin has been named as his successor.

**New Managers for General Tire**—A. M. Whaley, formerly southern district manager for the Kelly-Springfield Tire Co., has been appointed southern sales manager for the General Tire & Rubber Co., Akron, Ohio, and will maintain headquarters at Atlanta, Ga. Thomas L. Moore has been appointed southwestern district manager, with headquarters at Dallas, Tex.

**Large Distributing Concern is Launched**—The Consolidated Motors Co. has just been organized at Houston, Tex., by W. C. Turnbow, an oil operator and cattle raiser. The company has been incorporated for \$250,000 and will do a general automotive business. It represents the amalgamation of the following Houston concerns: Federal Motor Truck Co., Dwight Automobile Co., Johnson Garage, Consolidated Repair & Machine Shop, to which has been added a tractor accessory and tire department.

**Stroh Castings Insures Employees**—The Stroh Casting Co. has purchased a group life insurance policy to cover the employees of its plant. Insurance will be issued each employee according to his length of service and automatically increases in amount as his term of services increases. Those employed from three to six months will benefit to the extent of \$250; from six months to one year, \$500; from one to two years, \$1,000; from two to three years, \$1,500; from three to four years, \$2,000; from four years or over, \$2,500. In case of permanent disability the company is

prepared to pay the insured the amount of his policy.

**Johnson Joins New Concern**—C. B. Johnson, formerly sales manager of the Advance Automobile Accessories Corp., Chicago, and since then engaged in military service, has been released from service and is now sales manager of the Auto Components, Inc., Chicago, which has been organized to market the Red Star timer for Ford cars.

**Krueger Adds Briscoe for Wisconsin**—The W. H. Krueger Motor Co., Milwaukee, Wisconsin distributor of the Cole, has been appointed state distributor of the Briscoe and will handle both lines. N. B. Reisinger, head of the Briscoe Co. of Wisconsin, which relinquishes the territory, has accepted the position of sales manager of the Briscoe department of the Krueger company.

**Profit-Sharing Plan of Distributer**—Employees in the service department of Howard B. Smith, Inc., Buffalo, N. Y., hereafter will share in the profits of this department, it is announced by President Smith. At the end of each year the service department profits will be divided equally between the company and its employees who have worked steadily for one year or more. The firm distributes the Stutz and Elgin.

**Dealers Met at Spokane**—Five Spokane, Wash., car and tractor firms held their annual dealer conventions during the week of the show. The Big Bend Auto Dealers' Association held its convention at the Davenport hotel. The John Doran Co., Packard and Hudson distributor, gathered a score or more of their agents from various points in the Inland Empire. Riegel Brothers held their annual convention for Dodge Brothers representatives. The Mitchell, Lewis & Staver Co. held its annual convention for dealers han-

dling Mitchell and Jordan cars, and the International Harvester Co. brought its northwest representatives to Spokane for a week's schooling in tractor, trucks and magnetoes.

**Simpson Now Victor Truck**—The Simpson Truck Co., St. Joseph, Mich., at a recent meeting of the stockholders voted to change the name to the Victor Truck Co. and increased the capital stock from \$50,000 to \$150,000. This company anticipates building a new plant in the spring. Its officers are: President, Gilbert A. Fitch; vice-president, Harry S. Bander; secretary and treasurer, A. F. Rick.

**To Make Axleshafts for Cars**—The Motor Parts Co. has been organized in Detroit by M. F. Ketton, R. B. Merrill and E. F. Wilkinson to specialize in the production and marketing of axleshafts for all standard cars. Mr. Keeton, president of the company, is also president of the Consolidated Truck Co. Besides axles the Motor Parts Co. will market the Green Auto-Theft Protector, a device upon which a patent is now pending.

**Biggers Will Leave General Motors**—W. E. Biggers, for four years advertising manager of the Hyatt Roller Bearing Co. and now advertising manager of the Motor Equipment Division, United Motors Section, General Motors Corp., which includes the advertising managership of the Hyatt Roller Bearing Co., the Klaxon Co., the Jaxon Steel Products Co. and the Harrison Radiator Corp., is leaving Feb. 1 to become assistant to the president of the Owosso Mfg. Co., Owosso, Mich.

**Paige in Wisconsin Changes Hands**—The Osmond Motor Car Co., Milwaukee, Wis., distributor of the Winton and Chalmers, has been appointed distributor also of the Paige line in Wisconsin and Upper Michigan. The franchise recently was relinquished by the former Hoppe-Hatter Motor Co., Milwaukee, and taken by the Frint Motor Car Co., distributor of the Oldsmobile, but shortly afterward was transferred to the Osmond company.

**Elvidge Back with Ajax**—Fred M. Elvidge, Jr., has received his discharge from the army and has resumed his desk at the New York office of the Ajax Rubber Co., where he is the branch store supervisor. He left Ajax in February to join his regiment and then went through the Officers' Training School at Camp Gordon, emerging with a commission as second lieutenant. The resumption of his duties will once more place him in charge of the branch stores throughout the country.

**Lynch Heads Four-Drive Tractor**—Dr. George H. Lynch has been elected president of the Four-Drive Tractor Co., Big Rapids, Mich. A. V. Young was chosen vice-president and A. W. Stillwell secretary. No treasurer was named because all funds will be handled by the trustees. The company's financial statement indicates a net loss in the year 1918 of \$53,038. Figures quoted from a recent audit show that the tractor had cost 114.55 per cent of the selling price and that the loss per tractor had been \$252.52. The net assets had been reduced to \$90,686.64, patents included. Without the patents the assets totaled \$64,676.64. The cost of producing and selling had been \$2,002 a tractor up to Dec. 1. During December, however, the cost per tractor was \$1,623.45, a profit of a little more than \$100 a machine.



**POWER OF LIBERTY ENGINE**—Just how powerful the Liberty airplane engine is was demonstrated here recently when one mounted on a Packard 3-ton truck drove the truck around Cadillac square by the force of the propeller alone. The truck weighed 7000 lb. and was operated in abrupt turns, figure eights and curves. The radiator, hood, engine and transmission were removed from the truck before the trial. The demonstration was a part of exhibit of Packard war products at the Detroit branch



# From the Four Winds

## Glimpses at the World of Motordom

**MORE Pennsylvania Licenses in 1919**—With 178,000 license applications in, the motor vehicle division of the Pennsylvania highway department has sent out 132,000 tags. It is estimated that 1919 will be a \$5,000,000 year as regards income from licenses to the state. Up to the present, 1919 is more than \$500,000 ahead of 1918.

**Washington Registrations Show Increase**—In all 27,870 more motor vehicles were licensed in the State of Washington in 1918

than during 1917. The records show that 127,870 motor vehicles are operated as against 100,042 in December, 1917. Fees total \$875,-391.25, an increase of more than \$360,000 over the previous year.

**One Car Lights Community**—By anchoring a Ford chassis in his garage and connecting it with a motor-generator set, August Anderson, dealer and garageman, Holmen, Wis., has provided the little community with a "central light and power plant" furnishing

current to operate local industries and light stores, offices and homes. The capacity of this home-made electro-generating plant is 200 lamps and the demand already has reached capacity, so that provision probably will be made for a duplicate installation.

**Michigan Licenses Total \$2,875,266**—Last year 262,125 cars were licensed in Michigan and the total receipts from the license fees were \$2,875,266.32, all of which is available for highway construction. The licenses are divided as follows: Passenger cars, 235,603; commercial cars, 26,517; motorcycles, 7816; chauffeurs' licenses, 25,007; manufacturers, twenty-five; dealers, 770.

### Coming Motor Events

#### SHOWS

Chicago	Automobile Trade Association, trucks	Feb. 3-6
New York	Automobile Dealers' Association, cars	Feb. 1-8
Fargo, N. D.	Automobile Dealers' Association	Feb. 4-7
San Francisco	Motor Car Dealers' Association	Feb. 6-15
New York	Automobile Dealers' Association, trucks	Feb. 10-15
Albany, N. Y.	Automobile Dealers' Association	Feb. 15-22
Cleveland, Ohio	Automobile Trades Association	Feb. 15-22
Rochester, N. Y.	Automobile Dealers' Association	Feb. 15-22
Louisville, Ky.	Auto Dealers' Association, automotive	Feb. 17-22
Newark, N. J.	N. J. Auto Exhibition Co.	Feb. 15-22
Minneapolis, Minn.	Northwestern Automotive Exposition	Feb. 15-22
Des Moines, Iowa	Automobile Dealers' Association, automotive	Feb. 17-22
Grand Rapids, Mich.	Automobile Business Association	Feb. 17-22
South Bethlehem, Pa.	Lehigh Valley Auto Shows Co., cars	Feb. 17-24
St. Louis, Mo.	Manufacturers' and Dealers' Association	Feb. 17-22
Wichita, Kan.	Wichita Tractor and Thresher Club	Feb. 18-22
Hartford, Conn.	Automobile Dealers' Association	Feb. 22-March 1
South Bethlehem, Pa.	Lehigh Valley Auto Shows Co., trucks	Feb. 24-27
Springfield, Mass.	Cars and trucks	Feb. 24-March 1
Kansas City, Mo.	Motor Dealers' Association, cars	Feb. 24-March 1
Kansas City, Mo.	Kansas City Tractor Club, tractors	Feb. 24-March 1
Portland, Ore.	Dealers' Motor Car Association	Feb. 24-March 1
Cedar Rapids, Iowa		Feb. 24-March 1
Burlington, Iowa		Feb. 24-March 1
Duluth, Minn.		Feb. 25-March 1
Madison, Wis.	Association of Commerce	Feb. 26-March 1
Detroit	Automobile Dealers' Association	March 1-8
Columbus, Ohio	Automobile Show Co.	March 3-8
Buffalo, N. Y.	Automobile Dealers' Association	March 3-8
Quincy, Ill.	Automobile Trade Association	March 5-8
Omaha, Neb.	Automobile Trade Association, automotive	March 10-15
Syracuse, N. Y.	Automobile Dealers' Association	March 10-15
St. Joseph, Mo.	Dealers' Association	March 12-15
Peoria, Ill.		March 12-15
Boston, Mass.	Automobile Dealers' Association, cars	March 15-22
Harrisburg, Pa.	Motor Dealers' Association	March 15-22
Peoria, Ill.		March 17-18
Brooklyn, N. Y.	Motor Vehicle Dealers' Association, cars	March 22-29
Trenton, N. J.	Auto Trade Association	March 22-29
Pittsburgh, Pa.	Automobile Dealers' Association	March 22-29
Brooklyn, N. Y.	Motor Vehicle Dealers' Association, trucks	April 1-5

#### SHOW DATES INDEFINITE

Bridgeport, Conn.	City Battalion	Not Decided
Indianapolis, Ind.	Automobile Trade Association	Not Decided
Little Rock, Ark.	Automobile Dealers' Association	Not Decided
Philadelphia, Pa.	Automobile Trade Association	March
Philadelphia, Pa.	Motor Truck Association	March
Utica, N. Y.	Motor Dealers' Association	March

#### MEETINGS

New York	Society of Automotive Engineers	Feb. 4-6
New York	N. A. C. C., passenger cars	Feb. 5
New York	N. A. C. C., trucks	Feb. 11
New York	American Road Builders' Association	Feb. 25-28
Hot Springs, Va.	Automotive Equipment Association	June 2-6

#### RACES

Uniontown, Pa.		May 17
Indianapolis, Ind.	500-Mile Sweepstakes	May 31

**Look Out for the Motors!**—While it is generally considered advisable to stand aside when a motor car is approaching, one does not have to do so unless he wishes; that is, if he is willing to take the consequences. This is the decision of the supreme court. The case came up in Kansas in an appeal from Dickinson county. The district court instructed the jury that it was the business of a pedestrian to get out of the way of a motor vehicle when he heard or saw it approaching. The supreme court reversed the decision and held that foot travelers and motor vehicle men have equal rights on the highway.

**Motor Bus Line of 150 Miles**—A bus passenger line is to be established between Fort Worth, Tex., and the new oil town and field at Burkburnett, a distance of about 150 miles by the highway route that is to be followed. The Yellow Motor Bus Co. of Waco plans to place four buses in service in the beginning, and several more will be added later on. Each bus will be of the pay-as-you-enter type, heated and with accommodations for twenty-five passengers. Besides the passenger buses the company will operate trucks between the two points for transporting freight. J. C. Simmons and R. C. Lavy will be in charge of the new line.

**May Mark Iowa Roads Uniformly**—A bill providing for a uniform method of marking the highways of the state has been introduced in the Iowa legislature by Senator John W. Foster, one of the leading good roads enthusiasts of the state. All roads in the state are to be numbered, marked and indexed under the direction of the state highway commission and no other body is to be allowed to mark roads or trails. Standard, uniform sign markers are to be placed along the routes, including the connecting city streets by the highway commission, and maps of the state are to be placed on sale in the county auditor's office of each state at a nominal price, according to the bill.

**St. Louis Storage Rates Soar**—Warehouse storage rates on cars here have reached \$6 a month. When merchants first began to store cars for the spring trade they paid only \$3 a month. A few weeks ago the motor car men were not worried over this spring's business, but now they are all doing considerable thinking. The Tate-Gillham Motor Car Co. has leased the former Studebaker branch building and has obtained the proper bonded warehouse permits and will do his own storage. He says that the annual rental of the building will be covered by what he would have had to pay storage companies for three months this spring.